

# COMPUTERWORLD

## THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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### Tickling the Keys

With a switch of the keys, Liberace is one of the first entertainment personalities in the U.S. to register with booking agent, Talent Registry International's new computerized service. Using GE's Datnet 730 terminal on the information services network, booking agents anywhere in the U.S. can find out when Liberace is available for a performance in their city.

## Unbundling Suit Dropped for Lack of 'Joiners'

By Edward J. Bride

CW Staff Writer

PHOENIX — The user who brought IBM to court to challenge unbundling has dropped his case against the industry leader.

Motor Replacement Co. (MRC) filed a \$5 billion "class action" in October 1969, charging systems engineering services had been promised "for the life of the machine," in this case a 6420 magnetic ledger accounting machine.

MRC sought to establish as its class all owners of IBM computers and business machines who purchased those machines prior to unbundling, but attorneys said last week that no users came forth to join the action.

#### 'Small Payment'

The class allegations were stricken from the suit at the request of MRC, at the U.S. District Court here, and IBM confirmed that the settlement involved "a small payment" to Motor Replacement. The settlement "in part" offset expenses

and court costs, IBM related.

MRC had sought \$20,000 as its own damages, but the actual amount of the settlement was not made known by either side.

In its request to the court to withdraw the class allegations, the local firm said there was not sufficient evidence to maintain the suit as a class action, adding that obtaining the evidence would be too expensive.

The machine in MRC's lawsuit had limited memory, 40 words, with 160 wired program steps.

#### 'Extremely Few' Owned

A company lawyer said there were "extremely few" owned 6420s and that MRC was the only owner in Arizona. The plaintiff leased the \$40,000 machine in 1963, and exercised a purchase option the next year.

Several IBM users had inquired

as to the facts or charges in the case, but none actually joined the suit. One of the MRC attorneys said it was "truly remarkable that no one in the nation ever saw fit to assist us."

In informing the prospective

plaintiffs of the disposition of the suit, the lawyer's letter advised users who felt they had a claim against the manufacturer relating to unbundling to "press that claim yourself."

The suit was dismissed May 20.

#### Who's to Pay?

The troubles apparently stemmed from EAL not reading its contract closely, an airline official noted. The computers were financed by MDC Corp., a

(Continued on Page 2)

## Delinquent Accounts Grow

## DP Absolved for Gimbel's Ills

By a CW Staff Writer

NEW YORK — What was being called "computer problems and poor supervision" resulted in a \$6 million increase in delinquent charge accounts at Gimbel Brothers, the department store chain, and stockholders were informed that "computer problems and poor supervision" were aggravating consumer credit problems.

Gimbel's Controller Clarence Giffen later told CW the problem had "absolutely nothing to

do with computers," and that credit personnel were simply "asking the wrong questions" of the DP department, or "asking for incomplete information." He refused to elaborate.

The director of the store's MIS section, Edward Strobin, confirmed that computers were not the culprits, that the problem concerned DP only because "everything has to do with computers."

"Data processing is the hub" of any large business, Strobin explained, but the credit problem concerned computers "only in the broadest sense." He said the true problems were management problems, but refused to elaborate on that claim.

He did state "no matter how you use computers, it's people that either cause or prevent problems."

In rebuttal of a published claim that credit customers went months without receiving bills, Giffen said flatly, "That's not true. Our customers receive their bills more promptly than with any other major store in New York."

The company uses point-of-sale validation for credit purchases, a system installed in the last eight months, but Giffen would not

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## \$1/Day Package AVOIDS Contracts

By Phyllis Huggins  
and Don Leavitt

Of the CW Staff

VAN NUYS, Calif. — For \$1 a day you can get a fully user-tested report generator with some updating capabilities. There is no contract to sign. Just give 30 days notice if you want out. So far no one has cancelled.

This pay-as-you-use approach is being offered to users by Dylakor Computer Systems, Inc.

In addition to the DYI-250 "data base management system," Dylakor also has other \$31 a month packages. The newest is a data compression routine with which one user is saving one hour a day in running his files. Another program keeps track of data center costs. The company expects to develop a library of at least five general program products.

The company claims great success for the \$1 a day approach. Since the policy went into effect in the Los Angeles area in February, 60 users have signed up for DYI-250, the firm said.

The \$1 a day software supplied in tape form to users by mail presents the possibility of unauthorized duplication by users. But apparently the firm is not worried about such unauthorized copying. "For every man who would do that, 99 wouldn't," said Dylakor president Jim Case. Furthermore, he believes that there is no way today of adequately protecting software.

To limit the effect of any unauthorized copying of the program, however, DYI-250 does "self-destruct" after a number of uses. The legitimate user can get another copy from Dylakor, but the pirate is stuck.

DYI-250 is a parameter card-coded, table-driven report generator with some file updating capabilities. These are "primitive" compared to those offered by more complete systems such as Informatics' Mark IV, but are enough to set the Dylakor package apart from software such as Cullinan's Culprit.

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# Prevention of Public Access 'Key' to DP Center Security

**By Thomas J. Morton**  
CW Midwest Bureau

CHICAGO — The importance placed on security for DP centers by security professionals was graphically demonstrated here at the International Security Conference where more than half of the sessions and seminars dealt with how to make DP centers safe from everything from an anarchist's bomb to computer theft.

It seemed to be taken for granted that the audiences of security specialists knew of the need for DP security. The speakers told them the how of security.

Maj. James R. Lowe, a U.S. Army expert in bomb disposal, told CW that the ingredients for a 10-inch by two-inch pipe bomb would cost approximately \$10.88 and that those ingredients are readily available in the commercial market.

"Rigid control," Lowe said, "to insure no public access to a computer center is the key." He recommended a two-door system to prevent what he termed "rush-in types" (a door unlocked for a familiar face is also unlocked for a person just waiting for it to open).

He also recommended that all parcels and packages being delivered to a center be opened at a location away from the center.

Lowe suggested the establish-

ment of an evacuation plan, and then the drilling of the computer room staff in the procedure.

Another speaker, who requested that neither his name nor the name of his company be used ("we are not in the computer business and do not wish to enter it as consultants on computer room security"), spoke on computer theft, both by computer and from a computer.

He outlined three steps he considered of prime importance in protecting data from "on-line theft."

He said the three steps to frustrate thievery were: "protection of data line numbers; a dial-back system; and a good solid crypto system."

The three steps, he said, were designed to do two things. "One, it forces the thief to break existing laws if he wants to tap a

computer. He becomes 'guilty' of something . . . wiretapping, breaking and entering, something . . . which gives the desperate amateur something to think about and gives you something to use to go after the professional crook."

"Also, the tougher it becomes to steal from a computer, the more people the thief needs to do it. He may need a systems analyst, a telecommunications technician, electronics people

. . . lots of people."

"An unlisted number is no longer protection enough. Obtain the assistance of the telephone security people in protecting data numbers."

"Dial back forces the thief to extreme measures. It greatly enhances the skills he needs, his costs of operation, and the dangers to him for both getting caught and for getting prosecuted once apprehended."

Cryptology, he said, is required

when "time essences in the data being transmitted prohibit normal guarding of lines. In crypto systems, the codes should be changed when used. Ideally, crypto goes from terminal to a computer that handles nothing but the codes and handles it out of core so that it can't be dumped. It is that computer that does the codes, and, when satisfied, allows you through to the data. An 1130 protecting a 360 system is a good example."

## Tax Claim Based on 'Intangible' Software

(Continued from Page 1)  
Philadelphia company which then leased them to Eastern.

The contract specified that the user, not the owner, would pay property taxes but, as the Eastern official mused, "We simply

did not file our tax form."

After that, the Metro Commission (a form of county-like government in Florida) evaluated Eastern's DP property based strictly on the 1969 catalog price, the official explained.

Eastern should have appealed the assessment to the Metro Commission, acting as equalization board, instead of taking the tax case to the courts, a judge noted. Since the user did not exhaust the administrative remedies, Circuit Judge Harvie DuVal ruled against Eastern, but did say he thought computer software was not taxable.

Acting for the government, Assistant County Attorney Robert Ginsburg said software has a great deal of value. Eastern agreed, but stated the value was embodied in "intangible" property, and was therefore not taxable.

### Clouded Implications

The implications for newer IBM customers may be clouded by the fact that systems software, the operating system used to prepare the hardware for certain applications, is still "bundled" and is an essential part of any installation.

Included in EAL's \$4.6 million figure, and the lesser 1970 total, is an unknown amount for the systems software for the airline's

hardware configuration. When IBM separated prices of hardware, education, support and applications software (two years ago this month), it reduced catalog prices 3%, without placing any dollar value on systems software.

In challenging the software portion of the assessment, Eastern claimed to have brought in three independent consultants to appraise the "intangible" portion of the catalog price.

These were two area consultants, author Donald Spencer and Dr. John Sullivan of Florida Atlantic University, plus Dick Brandon of New York.

The case is scheduled for trial this month in Dade County Circuit Court, unless an out-of-court agreement can be reached, an EAL source stated.

## DP Absolved For Store's Ills

(Continued from Page 1)  
estimate the effects of these units.

The "yes-maybe-no" series of three lights indicates whether a customer's "negative authorization" is stored on a double-drum, capable of recording up to 200,000 names, Giffen stated. The drum interfaces with the store's twin IBM 360/40s.

## Census Clearinghouse Has the Data

MILWAUKEE — Analyzing requests for census data is one function of a state-run Census Clearinghouse established last year.

The agency operates under the Wisconsin Bureau of Planning and Budget, and acts as a service bureau for other state offices.

Besides receiving, analyzing and processing requests for census data, the clearinghouse directs development of computer programs designed to select

only census items pertinent to a user's needs.

The programs extract information from the 53 reels of Wisconsin's summary tapes obtained after the Federal Government's 1970 census.

### Correction

The cycle time of the new IBM 360/20-6 is 3.6  $\mu$ sec/2 byte, which is slower than the 2  $\mu$ sec/2 byte cycle time of the 360/20-5.

in the system since it was introduced two years ago. Dylakor said that it made changes requested by users, as long as they were generally useful.

### Early User

One of the early users was John Nownes of Warner Bros. Corp. He's been using the package for two years, from once a month to five times a day. DYL-250 is used primarily to extract portions of files selectively.

Nownes pointed out that an added advantage is its use as a complete auditing trail.

Dale McCallon of Alphanumeric Publication Systems, Inc. has used DYL-250 since February. "If you only use it three or four times a week you get your money's worth. Compared to BAL, Fortran or Cobol, you can save 25% of the time required to write programs," he said.

## There's more to a computer room than the hardware, the software, and the people.



That "More" will be covered by Computerworld in the June 30th issue in the Accessories, Environment, and Security Supplement.

- Accessories — The magnetic tape, the disk packs, the continuous forms and envelopes, and the cards.
- Environment — The power supply & back up equipment, the air conditioning, the desks, filing racks, tape seals.
- Security — Data safes, guard systems, data integrity.

If you've felt that your "More" is too often overlooked — this supplement is your opportunity to advertise directly to over 20,000 computer rooms — and do it in an exclusive "More" atmosphere Advertising forms close Wednesday, June 16th. For rates, production information, contact Dorothy Travis at Computerworld (617) 332-5606 — or the Computerworld Representative nearest you —

ask for the 'MORE' Supplement.

## Students' Project

# Letter Machine May Turn Into \$60,000 Computer

By Phyllis Huggins

CW West Coast Bureau

WALNUT CREEK, Calif. — Three high school seniors here started to repair the school's old form letter machine but then decided it was too limited and what the school really needed was a computer. So they are now using the letter machine as the input/output unit for what

## Scientists Compile Herbicide Data

NEW BRUNSWICK, N.J. — A national data bank, now in the planning stage, will provide better control of ragweed, crabgrass and more than 100 other objectionable plants, according to a Rutgers University scientist.

### 'True Weed Scientists'

Joseph C. Cialone calls himself and his colleagues "the first generation of true weed scientists." The real need is for basic research on just how and why present herbicides act as they do.

To help classify information, Cialone and others of the soils and crops department have developed a mark-score form to record the chemical name, stage of growth at application, method of application, formulation for use, pounds per acre, and other points of herbicide application.

Processed into punched cards the results are collated and compared in the final printout.

"Our dependence is on chemicals and refining methods of control — all aimed at the lowest possible dosage to achieve only the effect desired," he added.

### Keypunch Help Needed

DELANO, Calif. — Volunteer effort is being organized by the United Farm Workers to convert its records to punched cards. A couple of keypunch schools have offered their time to help and give their students experience with live data. Several more schools or companies with keypunches available in the Northern or Southern California areas are also needed.

may result in a \$60,000 computer, the equivalent of an IBM 1130.

Bob Banscoy and Phil Grasso, both seniors at Ygnacio Valley High School, took their proposal to Charles Gordon, curriculum consultant, who agreed it was a worthwhile project and pledged the needed \$500 from the federally funded "gifted" program. Banscoy, an amateur radio bug, is primarily responsible for design. Grasso is the programming specialist and a third friend, Dennis Bell, helps with construction.

The computer is being built in Banscoy's garage and the target date to have the CPU built is this month. The summer will be spent on programming and per-

ipherals. If all goes well by fall the school will have its own computer, a \$60,000 value for \$500 plus dedicated time.

All three youths have been aided by the professional community environment in which they live which encourages gifted programs and has technical people for assistance. A Dow Chemical Research plant across the street from the school has offered its 1130 to try out programs.

Banscoy plans to be an electrical engineering student at the University of California at Berkeley when he graduates.

"Once the [computer] applications broaden out from just scientific engineering and business applications as they are

now, it will change society. Process control of manufacturing lines will put a lot of people out of work but it is really "freeing" them from work. The role of work will have to change. Whether people will use their free time is another problem."

Grasso first got into computers in a special class for seven students that used a venerable CDC G15 at another high school. From there he used Fortran on Dow's machine. Now his main interest is machine language.

"You don't really get the feel of the machine with Fortran. It's a nice language if you want to solve problems but I'm interested in the computers."

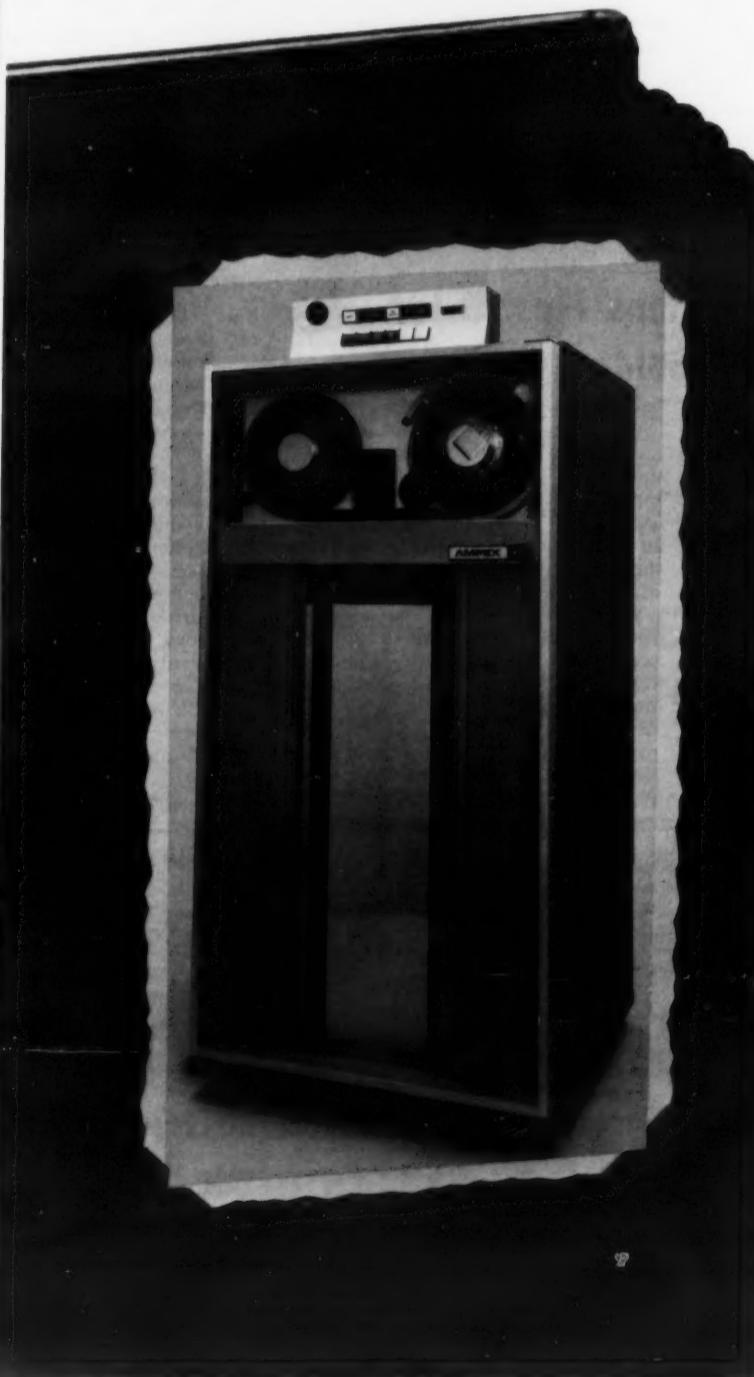
As far as the relation of society to computers, he says: "They

may seem infallible to someone who has never used them, but if you're acquainted with them you know how dumb they really are. Maybe everybody should be exposed to computers, then they wouldn't worry."

Surplus parts such as Standard Texas Instruments 74 series TTL are being bought at 5% or original cost from a surplus dealer in Massachusetts.

The biggest problem has been the core memory since they have had to use bargain rate transistors. The completed machine will have a 16-bit word, 16K memory, and feature parallel logic. The letter machine is a Smith Corona Marchant unit and the company is providing part of the tape units.

## Here's another of our safe drivers.



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## Pair Get 90-Day Sentences for Attempt To Seize NYU Computer Complex in '70

By a CW Staff Writer

**NEW YORK** — The extortion failed to materialize, but the would-be computer kidnappers got 90 days anyway.

That's the outcome, verdict and sentence in the case of the attempted seizure of the computer complex at New York University last year.

Two former faculty members, Nicholas Unger and Dr. Robert D. Wolfe, pleaded guilty to attempted grand larceny (by extortion) in the third degree, and were given 90-day sentences.

A grand jury indictment charged the pair with leading the

invasion of the NYU complex, with the stated goal of raising \$100,000 as ransom for bail of a dozen jailed Black Panthers.

James M. Hester, NYU president, refused the demands, and when police broke into the center, they found a burning gasoline-soaked fuse leading to a container of flammable (but otherwise unidentified) liquid near part of the center's \$3.5 million of scientific computing equipment.

Wolfe is a former assistant history professor. He was dismissed last year for disruptive conduct during unrelated events, a faculty meeting and a student dem-

onstration, both preceding the May invasion.

Untenured, Wolfe was fired in October.

Unger left the university before the pair was arrested last summer.

The NYU affair is believed to be the first time a computer center invasion has brought a jail sentence in the U.S.

Invaders of the Sir George Williams University computer center in Montreal in 1969 received fines.

The NYU complex is situated in the university's Courant Institute of Mathematical Sciences, overlooking Greenwich Village.

## News Wrapup

### Ampex, Memorex React to IBM Cut

Independent peripheral makers are taking their time responding to IBM's June 1 price cut on tapes, disks and printers, but answers are beginning to dribble in.

Ampex "plans to reduce disk and tape prices to continue to provide customers with a price advantage over IBM," but exactly what that means is difficult to determine. The only firm number to come out of Redwood City so far is an 8% cut in 2319 replacement price.

Memorex has instructed its salesmen to quote a price reduction on non-cancellable leases. While Memorex would not disclose how much of a discount it is giving, a spokesman did say the price cut wasn't as deep as IBM's.

There are noises of cuts at Telex, but there will be no official word until this week. Other independents have also said "no comment."

### House to Rule Soon on Privacy Committee

**WASHINGTON, D.C.** — The House Rules Committee narrowly approved Rep. Cornelius Gallagher's (D-N.J.) proposed Select Committee on Privacy, Human Values and Democratic Institutions.

The full House is expected to vote on the committee later this month. The Rules Committee vote was 7-6 with two abstentions.

Gallagher explained that a major focus of the Select Committee "would be to strip away the science fiction surrounding the computer and to insist that the computer industry develop more accurate systems."

Another job for the committee would be to study proposed legislation: "Every proposed piece of legislation sent to us from the Executive Branch or that we develop ourselves calls for the gathering of more personal information by the Federal Establishment," he noted. "We can make sure that every law we pass contains safeguards for that information."

### Electricity Expected to Be in Tight Supply

**WASHINGTON, D.C.** — It looks like a long, hot, and maybe dark summer for DP users.

The Office of Emergency Preparedness (OEP) said that electric power will be in "tight supply" this summer, especially in New York, Chicago, and right here in the nation's Capitol.

Director of OEP George Lincoln said the government was planning to conduct a campaign for energy conservation.

Meanwhile, Consolidated Edison has already launched such a campaign in New York, starting with an advertisement in the *Wall Street Journal*, urging consumers to "save a watt."

### Economic Data Bank Covers 160 Areas

**SPRINGFIELD, Mo.** — An economic data bank, containing data from 160 areas, is available to the public and can be used for classroom instruction at Southwest Missouri State College.

The new service includes data on employment, banking, city revenue, expenditures, valuations, city debt and assets.

### Beneath All That Hardware Lies a Real 'Softy'

**SAN BERNARDINO, Calif.** — Here's a thought. Computers aren't ravenous impersonal monsters out to take away your job. They can be quite personal and thoughtful thinkers.

Lonely programmers at San Bernardino Valley College will agree. When in need of remembrance they simply feed the pertinent tape to the minicomputer and type out their birthdate. The computer responds with the appropriate salutation and also takes care to tell the programmer exactly how many years he has worked, eaten, studied and slept. Tired thoughts for tired minds, perhaps.

Jim James, computer science instructor at the college, says the personal touch is just a game to make the serious approach more appealing.

The "game" approach helps destroy what James describes as a "superhuman" image, which strikes "a sort of terror into the hearts of many laymen."

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# Who says the mini is dead?

A computer fashion forecast from Cybermatics Inc., Fort Lee, New Jersey.



Mini-computer.

Maxi-computer.

at using them in on-line systems. We have to be. Many of our clients (computer-sophisticated companies who were in maxis when we met them) are now getting into minis as well.

The minis cost less to buy, cost less to run, take up less space and save wear and tear on their maxis.

Maximizing this potential takes talent, but in all immodesty we have that talent. In fact, of the eighteen great brains in on-line computers, four already work at Cybermatics.

Not in Fort Lee, New Jersey, it isn't!

We're up to our ears in mini-computers. We design software for them.

We're not denying that minis raise problems. They come without much software, so they demand more know-how than most companies can muster. They're a little like mini-skirts: You've got to be sure of yourself to get into them.

A call to Cybermatics (201-461-6171) can give you that sureness.

We don't make minis. Or sell minis. But we're experts



## **Electronic Memories unobtrusively mentions the development of its 7.3 million bits-per-module Megamemory 1000; very compact, but a little too large to be unobtrusive.**

Speaking gently about this little monster is a little like talking baby talk to a five hundred pound gorilla. (Actually, maximum weight is only 350 lbs.). But its speed belies its bulk: full cycle time of 1.5 microseconds and access time of 850 nanoseconds. You get a wide range of storage capacities—from 32K by 160 to 524K by 14. It's definitely a compact monster. A patented drive/sense scheme eliminates several switches normally associated with 2 wire 2 1/2D design. This straight-forward, practical design approach enhances reliability and breaks through price barriers that have always restricted core memory use in large-scale storage applications. As an add-on memory, Megamemory 1000 has been designed for interface with virtually any

customer specification. If you need fast large storage either as an extension of your main frame memory or for peripheral memories, it would be difficult to conceive of a more compact, faster or more economical solution. But... you never know.

**Here and Now:** Megamemory 1000 is a little too large to lug to your place for a demo. But it's working at our place. We don't claim off-the-shelf deliveries, but we are geared up to produce. Fast.

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**EM** Electronic Memories is a division of Electronic Memories & Magnetics Corporation, 12621 Chadron Avenue, Hawthorne, California 90250. Telephone (213) 644-9881.



(“Did we tell them to call it Supercore or Epicore?”)

## Editorial

### The Right to Challenge

Does a person have a right to see his dossier and to challenge the accuracy of information in it?

Under the new federal law, a person does have that right when the dossier is held by a credit reporting agency.

But he apparently does not have the right when the dossier is held by a government agency — even when he has good reason to believe it contains inaccurate information which may be forwarded to other agencies.

When the U.S. Supreme Court refused to hear such a case two weeks ago, Justices William O. Douglas and William J. Brennan dissented, stating that the case represented "an important question of procedural due process."

We certainly agree. And, instead of waiting for the Supreme Court to eventually establish that people have this right, we think the credit reporting law should be extended to government agencies.

The next step after that would be to strengthen the law to protect more completely the citizen from the dissemination of false, incomplete, and irrelevant information.

Gossip has always traveled at an amazing speed. But the speed with which information can now be retrieved from a data bank across the country has put the grapevine in the same class as the proverbial slow boat to China.

If efficient machinery isn't created for making sure that people get a chance to challenge information before it is released for retrieval, false or misleading information could literally be spread all over the country before a person knew about it.



### Recession Seems Remote

## Federal Workers Have Security Blanket

WASHINGTON, D.C. — A question being asked with increasing frequency these days is: "Don't they know what's going on down there in Washington?"

The question refers to the economic plight of the rest of the country, particularly regarding the unemployment situation which continues on the negative side of 6%.

The answer, in general, is that the government doesn't really know what's going on. After reducing the human condition to figures, the bureaucracy plays with these numbers.

The administration interprets the digits and tells us that things are really looking up, although there has been no serious dent made in the size of the unemployed population in quite some time.

And opposing congressmen — particularly Democratic Presidential hopefuls — look at the figures differently. They tell us that things are getting worse.

The nub of the problem is the entrenched bureaucracy.

While the rest of the country suffers with better than 6% unemployment — significantly higher in some states — the Washington, D.C., area has an unemployment rate less than half of the national average. The main reason is that a good portion of workers in the Capitol region are employed by the Federal Government.

#### Few Workers Laid Off

And despite periodic flurries of money-saving force reduction by federal agencies, few government workers are really laid off. Jobs are, for example, eliminated via retirement and transfer of employees to other agencies.

A large number of unemployed in the Washington area had once been working for electronics and computer companies here. As the government retrenched its R&D spending, the phalanx of small electronics and computer firms that had sprung up around the federal complex began to shutter their doors as business declined sharply and rapidly.

For the average federal employee, the job recession is

nearly remote. He has figures to prove it exists, he reads about it and even some of his neighbors — non-government types — are looking for work. But it has not really affected him directly at all.

In the face of job cuts in industry, he has received his normal cost of living increases and earlier this year a hefty general wage hike was approved for him.

Stores continue to do a brisk business in the metropolitan region, and sales in many of them are up over a year ago.

An incident that recently occurred in an organization to which I belong exemplifies the unreal world of many government workers.

#### Budget Dispute

A budget had been submitted for the upcoming fiscal year, providing no raises for employees of the institution. One individual, employed by the Bureau of Labor Statistics as an economist, intoned that not giving these people a cost of living increase — judged to be 4.8% last year by BLS — was immoral.

An opponent of the increase indicated that 40% of the members of the organization were not government employees; they do not get a cost of living raise and a number of them were unemployed. Under the circumstances there was nothing immoral, he added, in not adhering to BLS' guideline.

But the 60% won out, and the raise was passed.

#### Federal Workers Insular

There is no doubt that Washington tends to make federal workers insular. What the remedial action should be to bring these people out of their protective cocoons is not easy to determine.

Perhaps person-to-person communication between federal employees and the industry people would help. But one gets the feeling that the nature of the government beast makes it all somewhat futile.

## Letters to the Editor

### UCLA Hardware Oversized, A 360/91 Not Needed — Grosch

I read Phyllis Huggins' story about UCLA cutbacks [CW, May 19] with close attention and considerable rather cruel satisfaction.

While I was director of the Bureau of Standards center I contributed to the Government Accounting Office discussions leading to what Prof. McLean irately described as an "Alice in Wonderland accounting system."

On the contrary, what the perfectly simple most-favored-customer government policy reveals is that UCLA overbought: that it does not now and probably never did need a 360/91. They got snookered by their own ambition and their friendly discount-bearing IBM rep into oversize hardware, and then tried to load the cost onto the 10% of the work that was government funded. Didn't work! Lucky taxpayer.

Cut back to a 370/145, fellas. And be sure to let us all know whether the software really transfers; we're all itching to find out.

Herb Grosch

Gaithersburg, Md.

### Centralize Bank Programming!

I have reflected on Alan Taylor's analysis of the Master Charge system. I was therefore shocked and amazed to read Lee W. Allen's letter in the May 19 issue. It now becomes readily apparent why the system is substandard — each bank develops, debugs, implements and debugs its own programs.

Is there any reason why a franchised idea such as Master Charge can't also take advantage of basic, if not sophisticated, principles of management such as centralized programming development?

Spyridon Aspiotis, CDP

Bethesda, Md.

### CDPs Need Recognition

I applaud Alan Taylor and personally thank him for his efforts to bring recognition to those who

have achieved professional status in our field through the CDP. Also, I commend Computerworld for permitting this effort to be published in our behalf. I seriously doubt that DPMA can or will support the professional movement. They certainly have not demonstrated their willingness by their behavior thus far.

James H. Blumenberg, CDP

Hazelwood, Mo.

### Singer System Has a Say

I was most interested in the article by Frank Pista called "Upward Mobility One Key to Small Systems Selection" [CW, May 19]. He has missed the Singer System Ten in his analysis which is a true multiprogram firm-wired partitioned system. The price/performance ratio of this system far exceeds any on the market.

It can have 20 different programs running simultaneously with a wide range of peripherals available, including disk drives, magnetic tape, paper tape readers and punches, line printers, CRTs, card readers and punches.

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### JCCs, 'Meeting Unrelated'

The May 12 article on the Northern California Computer Invitational Conference leaves an implication that is untrue.

I contacted the organizers of the conference and asked that the name be changed — to eliminate confusion with the Joint Computer Conferences. The JCCs are long-established and have no relationship to the privately sponsored meeting in question.

We had only one conversation. It was friendly, relaxed and mutually cooperative.

Richard I. Tanaka  
President  
Afips  
Montvale, N.J.

# Membership, Exam Entry, CDP Protection on Agenda

After the first full week of voting on the CDP Questionnaire [CW, The Taylor Report, May 19], it is clear that the trend so strongly favors having indepen-

## Some Thoughts

Some funny items cross my desk every now and then, which really don't fit into column material. Some of them are from readers, others just generally occur.

One of them deals with the question as to just how I would go about rejecting a Cobol program, if it was not written up to standard. The questioner, a DP manager, just couldn't see the investment of a complete program being junked for such a reason.

Well, now, who said anything about a complete program being written before it was noted that it had to be junked? The standard in question — that the program should be understandable to a casual programmer — can be enforced simply by the DP manager just looking over his people's shoulder every day while writing continues. And rejection need not mean juking — merely rephrasing to make the meaning clear. So it is possible, given management.

Then another odd fact that appeared dealt with a different IBM documentation mystery. Like the sort case (where three separate documents had to be correlated before users could realize what was going on), the data was available — but not easily. But the gimmick is different.

Here the item is the most basic thing of all — the instruction times of the 370/155. They are not classified confidential, and were released (in machine cycle form) last July for use in making sales, etc. But they were deliberately not given to customers — just to be extracted as sample times.

Even now, with the Model 155 delivered months ago, the users normally don't have them.

I wonder why — and how people can order a system with such gaps in the specifications?

Many A True Word Is Spoken . . .

IBM's announcement of its new display starts out by pointing out there are many things about it not visible to the eye, and the more you look at it the more things you can do with it. It's a very true statement, as I found out when I went down and played with one last week.

Turns out that you can affect the display without touching it with the light pen at all! I was able to change it from a couple of feet to the side. And that's not all. There are a number of invisible test spots that you can put on the display without anyone knowing — and use to change the program as to what is displayed!

Should be a very interesting challenge to an embezzler as to how best to use these invisible "displays" — and to an EDP auditor as to how to stop him. Right now my money is on the ingenuous embezzler's side.

dent CDP holders' organization and keeping the standards of the examination reasonably high (though not so as to form an exclusive club of present holders) that now the main interest can concern some of the next decisions that will have to be made before such a group can really be formed.

Luckily, the voters did select a viable course. They did not ask for the impossible — like a role for the CDP holders in the exam preparation but no CDP holders' organizations! They opted for a really practical path so that items can go forward.

But, in the correspondence, and the remarks written on the questionnaire were a number of other points. One dealt with the membership of the organization. How about the people who pass the Registered Business Programmer Exam? Or those who pass four out of five parts of the CDP? For that matter, how about people who have passed the membership examinations of the British Computer Society, or other non-DPMA given exams? Or those who are studying for them? Should these be allowed into some form of membership?

### Membership Implied

All these points became immediately important when the voting showed an independent organization was wanted — not least because there is the question of the name of the organization. It simply has to have one — and the wrong one could seriously hurt it.

The two currently used names — the Ad Hoc Association of CDP Holders and the Society of Certified Data Processors — differ to some extent, in that the form of certification, although strongly implied, is not stated in the Society label. Nor does it exclude a student division, allowing for future members. But the decision has to be taken soon.

### Promotion and Protection

Another quick decision is involved in just what the purposes of the new organizations are to be. Clearly, from the voting one of the purposes of the organization is to first win and then carry out, some role in the preparation and the review of the annual CDP examinations. Letters also added that we would need to publicize CDP virtues.

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**The Taylor Report**  
By Alan Taylor, CDP



## CDP Organization Questionnaire

Sponsored by the Ad Hoc Association of CDP Holders

After circling those answers that you agree with, please give your name and address.

Return to Alan Taylor, CDP, c/o Computerworld, 797 Washington St., Newton, Mass. 02160

1. What should the name of the organization be?
  - A. The Association of CDP Holders
  - B. The Society of Certified Data Processors
  - C. Don't Care
  - D. \_\_\_\_\_
  
2. Who should be able to join the organization?
  - A. Only CDP holders
  - B. CDP & RBPE holders
  - C. Anyone who has passed an acceptable data processing exam
  - D. \_\_\_\_\_
  
3. What examinations should be recognized for membership?
  - A. Only the CDP
  - B. Only the CDP & RBPE
  - C. Only DPMA-backed exams
  - D. Such exams as the organization is satisfied with
  
4. Who should be accepted for some form of membership?
  - A. Only those who have passed the exams
  - B. Those who have passed most the exam
  - C. Those who have taken the exam
  - D. Those who are studying for the exam
  
5. Who should be able to take the CDP?
  - A. Anyone with \$50 to spare
  - B. Only those with five years DP
  - C. A combination of college and experience should qualify
  - D. Anyone holding the RBPE
  
6. What help can you give? \_\_\_\_\_

Name (with CDP, RBPE if held) \_\_\_\_\_ Address \_\_\_\_\_

And that is agreed.

But, virtue often needs protection, as well as publicity. Does that mean that the organization should have some standards (After all, entry to the examination involves accepting a set of standards as it is, so that would be nothing new.) And, conceivably, also a means of enforcing the code?

In short, would the organization expect to help pull the status of the CDP up in reality, rather than simply by Madison Avenue cosmetic methods?

### Effective Clout

The final question brought up was the question of the means that the organization should have to carry out its work. Some direct offers of help were received — like the use of the publications and graphic facilities in a Connecticut organization. And faculty members from DP departments across the country made their support so strong that the possible use of their

academic prestige and special poses requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

But these were the exceptions, because the question was not asked. And it is important, to have at least some idea when organizing a new entity.

So, to carry forward on what you have voted for, here is a CDP Organization questionnaire. Would you please fill it in, and return it to me, c/o Computerworld, as soon as possible.

Fill it in whether or not you filled in the earlier questionnaire and whether or not you yourself are a CDP holder. You will be doing all of us a real service.

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# Russia's Crash Program May Close Data Bank Gap

CW European Bureau

LONDON — Russia and the U.S. have at least one thing in common — a desire to use computer data banks to collect information on political dissidents.

At present the U.S.S.R. has neither the machines nor the technology to create computer data banks such as those now in

use in the U.S., but a new crash program may close the data bank gap.

A proposed data bank network would consist of a large number of regional centers, each holding data relating to houses, flats, lines of communication, construction plans "and the like" in the region. All regional centers would

be interlinked, and linked to central security/inquiry systems in Moscow.

"And the like" is interpreted to mean that some machines should be dedicated to the collation of personal details, and opinions on many aspects of social life.

In fact it could provide a powerful tool with which the Kremlin could exercise control over society, described by one British journalist as "so total it could make Orwell's 1984 look

like a Liberal revival."

The data bank network has its advocates, primarily among the academic and political classes. But it also has opposition, although "invasion of privacy" is hardly an issue in Moscow. (In fact, the security police are already believed to have a comprehensive data bank of personal attitudes and similar information).

## Free Market

Objections come more from those who believe that an even

tighter control of the economy will cause an even greater slowdown, and that the economy should be allowed to operate within a free socialist market — such as that established in Czechoslovakia during the short-lived Dubcek regime.

The crash program just launched in U.S.S.R. is aimed at producing between 1,200 and 1,500 large machines in the next 10 years — which is roughly the number of machines and the time scale necessary to establish a large data bank network.

## Speedy Tests Assure an Honest Race

PALO ALTO, Calif. — Keeping horse races honest is becoming an easy, fast procedure since track officials have adopted the latest computer-aided chemical techniques. The new techniques quickly identify the drugs used to alter race horses' speed.

On the Delmarva (Delaware, Maryland, Virginia) peninsula, home of Harrington Raceway, Dover Downs and Brandwine race track, winners of individual races are presently undergoing post-race blood, urine and saliva tests performed with Hewlett-Packard computer-aided analytical equipment.

A post-race computer analysis of a horse now takes approximately 10 minutes, versus a previous time of 40 to 50 minutes using less accurate manual techniques, says Cecil Shirey, chief chemist for Eastern Research Associates laboratories (ERA).

"With the post-race tests, any horse that shows signs of being drugged is automatically disqualified and purses are held up until further tests are performed,"

said Shirey. The additional tests are made to double-check the original findings, he added.

### Measurements

The measurements are made with a Hewlett-Packard Gas Chromatograph (GC), an analytical measurement system that uses a remotely located Hewlett-Packard computer connected to the equipment by ordinary telephone lines.

The procedure for analyzing the horses involves placing up to 36 samples, one per horse, into the GC and typing simple statements on the teletypewriter. The GC turns each of the samples into a gas which it separates into its many constituents. By monitoring the order of separation and the amounts of each constituent, the remotely located computer identifies the exact contents of each sample. When the computer analysis is complete, the system prints both the type and amount of chemical drug in each sample. Each sample takes four to five minutes to analyze completely.

Trans-Atlantic cables will provide the communications medium, and a "worst case response" would be about five seconds for a "difficult situation" to be displayed, Taylor-Smith claimed.

Twenty-three of the CRT terminals will be on-line with the airline in London and Southampton, England, and New York. BOAC would thus be acting as a "reservation broker" for international travel arrangements, Taylor-Smith noted.

**Drug Data File Accessible**

HARTFORD, Conn. — The installation of a teleprocessing terminal at the Capitol Region Drug Information Center will enable researchers to access files compiled by the National Institute of Mental Health.

The files, stored in a computer at the National Clearing House for Drug Abuse Information, contain over 5,000 research studies, papers, abstracts, statistics and other reports on all facets of drug abuse.

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## Russian No Problem for This Translator

By Michael Merritt  
CW Staff Writer

**W R I G H T - P A T T E R S O N AFB** — By interpreting case endings and word order, a computer is turning out colloquial translations of Russian technical documents at 100,000 words an hour.

The machine-generated translations need some editing by linguists, but for the most part can be understood by the average engineer.

The system is run by the Air Force's Foreign Technology Division at Wright-Patterson in Dayton. The group translates documents in 14 languages, but only Russian is done by the computer. Chinese and German may be added in the future, however.

Primarily technical, most of the material is available from the

Commerce Department's National Technical Information Service after it has passed through Wright-Patterson.

The system used is called Systran, and was developed by Peter Thoma of Lastec, Inc., a California software house.

Input is the greatest bottleneck in the system, which uses a 360/65, working at MTSTs equipped with the 31-character Cyrillic alphabet, can keep the 65 busy for only about two hours a week. The system still translates from 10 million to 12 million words of Russian a year, however.

The Air Force group which created the system is now exploring OCR equipment to speed the process, but the lack of a standard Russian font is hindering efforts.

## DP Sharing Cuts Hospital Costs

**P H I L A D E L P H I A** — Consolidation and computer sharing are cutting DP costs for two hospitals here. The Nazareth Hospital is using the DP facilities of the Albert Einstein Medical Center nearby.

"For a single investment we can support much more activity with a resultant lowering of unit cost," said Jerome Baron, Nazareth's vice-president for fiscal affairs.

Computer sharing started in January, initially preparing the payrolls of the two hospitals. Other employee financial records are now on line, as well as in-patient records. Plans call for putting other payables programs, and possibly out-patient records and receivables onto the one computer this year.

Einstein's DP manager, William L. Heffelfinger, first had the

idea of pooling computing facilities. "I felt we ought to do something, begin somewhere to unify our efforts," Heffelfinger said. "It seemed to me that a good place to start was with the fiscal or business side of the hospital."

Heffelfinger began canvassing hospitals in the North Philadelphia area, and found an interested reaction from James W. Heflin, Nazareth's assistant administrator for fiscal affairs. Talks began in October, and actual sharing in January.

In a joint statement, Einstein and Nazareth officials said: "One answer to the critical problem of spiraling costs in the delivery of health services must be a banding together of hospital services and facilities to avoid duplication of effort and equipment wherever possible.

Since terms in Russian may have different meanings depending on their context — aeronautical, metallurgical — the system includes special dictionaries translating different types of papers.

While the Systran output still needs some editing, it produces much better translations than its predecessor, which made only word-for-word translations.

The earlier system, using a special-purpose computer, would produce a sentence like this:

"On active section of trajectory on rocket act thrust of engine-motor aerodynamics forces gravity and control force."

The Systran translation of the same sentence comes out:

"On the power sector of the trajectory, the thrust of the engine, aerodynamic forces, forces of weight and controlling forces act on the rocket."

The older system translated at 5,000 words an hour, one-twentieth the rate of the 65. Since the new system uses a general-purpose computer, the program can be updated to provide better translations.

## Selective Partying

**C L E V E L A N D** — Ever feel like you didn't belong at the neighborhood party? Well, if you are one of the invitees to the Mad Computer Affair June 11, chances are you'll probably fit right in.

The Cleveland Orchestra Junior Women's Committee has come up with a plan for matching guests to hosts at a benefit for the Musical Arts Association. The committee will sponsor 15 simultaneous, informal dinner parties in suburban homes and where you go depends on how a computer analyzes where you belong.

And where you belong depends on how you answer a detailed psychological personality test with each invitation.

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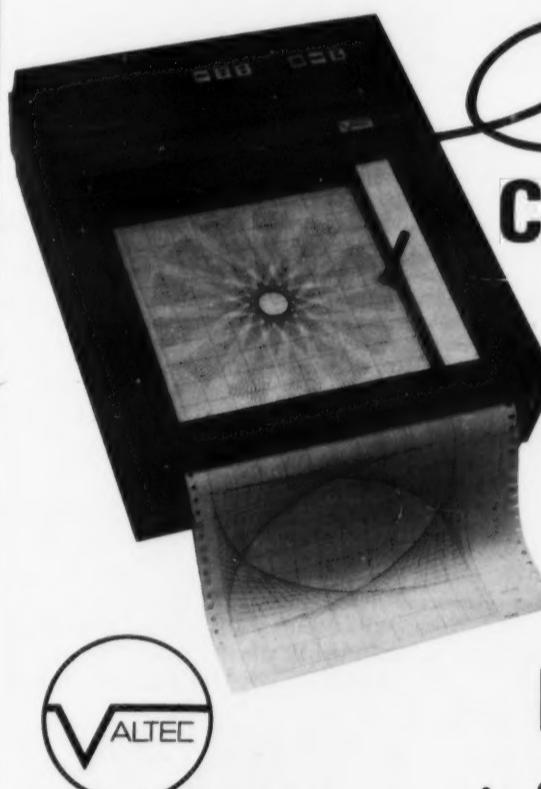
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computing. Now I'll get a chance to meet most of the authors—at ACM'71.

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"Meeting people you've read and respected is the best part of a conference," says Mel. "And asking an author questions he probably didn't think of himself when he wrote a paper or an article. At ACM'71, we're

introducing new technical session formats to maximize this kind of interaction."

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**Random Notes****English RPG Narrative Generated by 'Documatic'**

FORT LEE, N.J. — Documatic, a documentation system for programs written in RPG, has been adapted to run under OS/360, according to the developer, Data Usage Corp. (DUC). It had previously been available only for DOS/360 and Univac 9000 series users.

Documatic is said to be unique among documentation packages in that it produces an English language narrative, rather than a flowchart of the subject program. The package leases for \$80/mo and can be purchased for \$1,600 from DUC at 2460 Lemoine Ave., 07024.

**Critical Path Scheduling Available on Com-Share**

ANN ARBOR, Mich. — Anyone with a scheduling problem can use the Com-Share Critical Path Scheduling System (CPSS) to determine optimum times for his project activities. The program is available on the Com-Share time-sharing network.

CPSS is said to handle projects involving 1,600 activities, and is flexible enough to allow a manager to revise his schedules as changes occur. Com-Share has local offices and can be reached through P.O. Box 1588, 48106.

**Estimating Techniques Improved On 'Cost' Package, T/S Service**

SILVER SPRING, Md. — Financial managers can use the cost estimating techniques of K.M. Guthrie with the Cost System of analysis from Icarus Corp. The Cost System is also available on a time-sharing basis through the Infonet service of Computer Sciences Corp.

The Guthrie techniques are said to examine more variables, and develop more accurate estimates, than any technique short of actual vendor quotes. Written in Fortran IV, the Cost System can be implemented on Univac 1108 or IBM 360/65. The 360 version takes 65K storage under OS. The basic system before customization costs \$1,500/mo from Icarus at 13125 Clifton Road, 20904.

**Routine Prepares COM Tapes**

DES MOINES, Iowa — Users having a Datagraphix Micromation Recorder and an IBM 360 can create a report tape formatted to produce microfiche with the Micro Fast subroutine from National Micromation Inc. (NMI).

Micro Fast is an in-line single-pass routine, written in Assembly Language, which can be CALLED from a user's application program. Micro Fast costs \$1,000 from NMI at 2611 Ingersoll, 50312.

**Cyphernet Offers Delayed Jobs**

ANN ARBOR, Mich. — Users of the Cyphernet time-sharing network now have an option, Foreground Initiated Background (FIB) processing, which allows programs to be developed interactively and then executed in a delayed mode not requiring the user to connect to the system.

All programs and files which can be processed on the time-sharing system can be run without modification under FIB, Cyphernet said. The results are directed to a choice of output devices for transmission to the user. The firm is at 333 Maple Village Center.

**'Total Mailing List'****Flexible Package Has General Utility**

By Don Leavitt

CW Staff Writer

WASHINGTON, D.C. — Cobol-based installations that use the Total Mailing List System (Tomalis) from Applied Library Resources Inc. (ALR) have more capability available to them than is suggested by the name of the package. It is a basic file update system easily enhanced with output almost incidentally designed for mailing lists.

Tomalis includes modules that accept

OCR readings, punched cards or magnetic tape as input and edit data into acceptable format.

Although intended for use primarily with name and address data, the files supported by Tomalis are not limited to that range of information. Files may be either on disk or tape, ALR said.

Processing within the system includes the generation of identification codes for each record, based on user-supplied parameters.

Updating and sorting of the files is also built into the Tomalis package.

The system eliminates duplicate entries and prints a list of records deleted. Another section of Tomalis produces printed copies of files in any user-specified sequence.

The principal output of Tomalis is intended to be Cheshire-type mailing labels, gummed labels or print-image magnetic tape for off-line printing.

Written in a basic form of Cobol, Tomalis can be implemented on an IBM 360, HIS 200, NCR Century or any other CPU that supports a Cobol compiler. Minimum configuration, according to the company, is 12K bytes of memory, three tape units or disk drives, and a line printer.

Tomalis can be purchased from \$1,000 from ALR at 1343 H St. N.W., 20005

**Terminals Will Share 1130/APL Adapted to 360 Specifications**

WHITE PLAINS, N.Y. — IBM 1130 users whose configurations include the Multiple Terminal Communications Adapter (MTCA) and 2741 terminals will be able to use APL on a time-sharing basis with an IBM support package, APL/1130-MTCA, expected to be available in first quarter 1972.

Currently APL is available on the 1130 but only as a special subset of standard APL, and for only one user at a time. The system being developed will resolve all incompatibilities between APL/1130 and APL/360-OS or DOS, IBM said.

The time-sharing version will support up to 16 terminals on 32K 1130s and up to eight terminals on 16K systems. However, IBM warned, response time depends on the number of users and what they are doing. Therefore, the recommended number of simultaneous users is only four to six on 16K, and seven to 10 on 32K systems.

The system will allow APL programs to be shared by all users within an installation, but will provide management with multiple levels of security to prevent unauthorized access. Functionally, users will have a set of system commands and utility programs to ease library maintenance. Effective debugging capabilities and program-editing facilities will also be included, IBM said.

The APL/1130-MTCA package will be

available early next year for \$200/mo on a lease arrangement.

**New 'Foresight' Bows on GTE Net**

WHITE PLAINS, N.Y. — The non-programmer executive can generate financial reports and calculate the effects of alternative plans of actions on a time-sharing basis, through the Foresight II program available on GTE's Data Services Division network.

The program has a set of English language instructions with no DP jargon. As a result, the user works in terms that are familiar to him and can concentrate on planning rather than on controlling the computer, GTE said.

**Mergers Studied**

Foresight II is said to enable users to test the impact of changing conditions on the company or industry, or to explore a company's profits and capital needs. Merger and acquisition analysis can be performed or the user can develop financial and econometric models on which to base courses of action.

The program is particularly applicable to multidivisional corporations, according to GTE. The results of various divisions can be combined and consolidated reports generated on a real-time basis, the

company said.

Admitting that Foresight II is similar in name and purpose to programs available on several other time-sharing networks, a GTE spokesman told CW that the program was independently developed for the Data Services Division.

It is available through local dial-up to GTE Data Services offices in Boston; New York; Hartford, Conn.; Philadelphia; Atlanta; Tampa, Fla.; Chicago; and East Lansing, Mich.

**ATI-16 Cross-Assembler Enhanced by Developer**

CHAMPAIGN, Ill. — The ATI-16 cross-assembler that permitted programs for Honeywell 16 series minis to be assembled on the IBM 360 has been enhanced by its developer, Automation Technology Inc. The "extended" ATI-16 includes conditional assembly, new pseudo-ops and op codes defined in Version 2 of DAP-16, and increased symbol table capacity. The extended version costs \$3,500, from Five Henson Place, 61820.

**Cobol Source Code Optimized Following 'Stage II' Guidelines**

SILVER SPRING, Md. — Cobol users should be able to improve program run times and reduce core requirements by applying source language efficiency concepts spelled out in a seminar-software combination, called Stage II, from Optimization Sciences Inc. (OSI).

Stage II analyzes source code to identify poor programming. The average Cobol program carries a reducible run time overhead of about 50%, according to OSI, and Stage II is said to eliminate that excess.

The seminar, entitled Stage I, provides a two-day forum for discussion of Cobol source optimization. The software, Stage II, implements the concepts brought out during the seminar.

The software analyzes the working-storage section of the data division, for example, and produces a card-image correction file for reinsertion into the source program or library. Errors in this manner include unsigned numerics.

In the Procedure Division, Stage II adds diagnostic comments to the side of statements that should be reviewed. The significance of the comments would not necessarily be apparent to a user who had not attended the seminar, OSI said.

Stage II can be used in conjunction with optimization programs such as Capex Corp. Cobol Optimizer that improves a program at the object code level, OSI said.

The Stage II software operates under OS/360 in approximately 80K bytes of core.

The combination seminar-software package costs \$2,150. This provides seminar training for two, required software, documentation and first-year maintenance. OSI is at 816 Thayer Ave., 20907.

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## Sigma 3 Gets Sort, RPG

EL SEGUNDO, Calif. — A Sort package and a report program generator are being developed by Xerox Data Systems to make the Sigma 3 more useful in commercial data processing applications.

Meanwhile, the operating system for the Sigma 3 has been modified to support disk packs. Only Rapid Access Disk (RAD) units had been supported until now, the company said.

The RPG for the Sigma 3 is source language compatible with RPG for IBM's 1130, 1800 and 360/20, according to XDS.

Sorting is essential to commercial applications, according to XDS, which reports that 30% of users' machine time is devoted to such operations. The Sort package will use either disk packs or the RAD units, the company said.

The Sort can be used with both RPG and Fortran programs, a spokesman said. The combination of the two new capabilities can be used to solve processing problems in payroll, inventory control, accounts payable, sales analysis and other business applications.

Each of the new packages can be implemented on an 8K Sigma 3, the company said. Under XDS' policy, languages, operating systems and utilities are 'bundled' and therefore available without cost to Sigma 3 users.

The Sort is expected to be ready in fourth quarter 1971, the RPG package in the first quarter of 1972.

## Package Prints DOS Use Totals

ARLINGTON, Va. — DOS/360 users are able to develop statistical studies and billings based on DOS Version 25, with the DOS Job Accounting Report System (DOSjars) from Compuetics Corp.

Working with the job-step start time, CPU time, device utilization and other accounting parameters from Version 25, DOSjars generates a series of standard reports.

The basic reports produced by DOSjars show computer utilization by device, operator, job, programmer or user department. CPU time and device use are displayed, along with overhead and wait times.

The system permits the input of billing rates and percentage variances by job priority or shift so that backup data for user

invoicing or in-house memorandum charges can be generated.

DOSjars captures job accounting data on disk but transfers it to tape with operator intervention when disk storage is full.

DOSjars is written in Assembler Language and requires a

14K partition under DOS/360.

The system cost of \$550 covers program documentation, user guide, objection deck and demonstration data. The company provides a two-year maintenance guarantee, from 944 S. Wakefield St., 22204.

## Cost of Project by Class Reported Using 'Manage'

DALLAS — Users are able to collect and distribute costs from terminals connected to an IBM 360/40, through a software system offered as a service or an in-house package from Management Systems Corp. (MSC).

The Professional/Manage system is structured around job, project, activity, client and resource files. In this instance, a resource can be a man, an element in a computer system, or any other entity for which the user wants costs collected.

Time or expense entries from CRT or teletypewriter terminals are extended and posted to the appropriate file on a real-time basis. Thus, month-to-date and project-to-date costs are available from each file upon inquiry, the company said.

The Manage Language, upon which the cost system is based, is described as RPG-like in its structure. It allows the user to build programs for periodic reports using the Professional/Manage file system. There is, in addition, a general ledger journalizing capability in the system, MSC said.

The Professional/Manage system supports IBM 2260, Sanders 620 and Teletype Model 33 and 35 terminals, according to the company. When used as a service tied to MSC's computer center, periodic reports are mailed to the user.

Used in-house, Professional/Manage and the Manage Language require 131K bytes of storage on a 360/40 or larger CPU operating under DOS. The system costs \$50,000 on a purchase basis. Lease arrangements and plans for implementing the capabilities on a service basis are available from 7007 Preston Road, 75205.

## CAI System Available On APL Plus Network

WOODLAND HILLS, Calif. — Teachers without special programming skills are able to build computer-assisted instruction (CAI) lesson plans and tests with the CBISLearn system available on the APL Plus network from Scientific Time Sharing Corp. (STSC).

The system developed by CBIS Information Systems operates in three stages. The instructor enters course identification and material interactively. In addition to text, the instructor is able to define the sequence in which the material is made available to the students. This can include loops back to prior material in the event the student needs review.

Although more sophisticated capabilities are in development, the current version of CBISLearn supports only true-false or multiple-choice answers to test questions.

The system captures responses by question and by student so that the teacher is able to review the material covered, the time taken, and the accuracy of test responses. The system is able to provide an overall analysis of the material by course, showing, for example, the number of times each question was answered right or wrong, and by which students.

With that information, the teacher can reshape his material to make it more effective, the company said. CBISLearn is available nationwide at standard Scientific Time Sharing Corp. rates. CBIS is at 6355 Topanga Canyon Blvd., 91364. Scientific Time Sharing Corp. is at 2101 S. Street, N.W., Washington, D.C. 20008.

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June 9, 1971

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## Bits and Pieces

### Friden Increases Prices Of System 10 Components

SAN LEANDRO, Calif. — Prices on components of the Singer-Friden System 10 have been increased. The Model 20 processor, for example, had its price changed from \$11,000 to \$9,500, but no longer includes the Fast Access Channel (FAC) as standard equipment. The FAC price raises the total cost of the processor to \$12,000. A 10K core module went from \$4,950 to \$5,200.

Other price changes in the System 10 include: Disk drive, from \$12,000 to \$12,500; disk controller, from \$2,500 to \$3,000; auxiliary disk controller from \$500 to \$650; magnetic tape controller, from \$2,500 to \$2,700; paper tape reader, from \$3,800 to \$4,000; paper tape punch, from \$4,500 to \$5,000; and the Model 70 work station from \$3,950 to \$4,950.

Comparable price increases have been made in lease prices, the company said.

### Single Drive Linc Mag Tape Unit Offers Low Cost, Direct Access

BELTSVILLE, Md. — A single drive version of its CO-600 Linc Memory magnetic tape drive is said by Computer Operations, Inc. to provide direct access to any block on the tape.

The 150-ft reel can hold over 100,000 words. Transfer rate is 4,200 word/sec. The unit will be shipped in September at a price of \$3,950 including interface and software from 10774 Tucker St., 20705.

### Mini-Based Training Device Used To Teach Firmware Programming

SANTA ANA, Calif. — The Microdata 800 minicomputer is a teaching device for firmware programming concepts from Microdata Corp.

The mini is equipped with a panel of 512 switches through which 32 commands may be entered into the microprogram command sequence. A read-only memory contains six utility I/O routines. Also included are a 4K core memory, a TTY/display controller and an I/O display panel.

The device, priced at \$10,000, is available on a 60-day schedule from 644 E. Young St., 92705.

### Microfilm Jacket Has Title Code

CHICAGO — The M16B Microfilm Jacket from Wilson Jones Co. has a special coded area at the top for entering and identifying titles.

The jackets are available in bulk quantities from 6150 Touhy Ave., 60648.

## Interface Connects PDP-11 to IBM 360

By Frank Piasta  
CW Staff Writer

PLAINVIEW, N.Y. — An interface that links a DEC PDP-11 to an IBM 360 system seems tailor-made for the user who wants to go into distributed computer systems.

The CCS-371 Interface Unit from Custom Computer Systems, Inc. enables bidirectional communication between the mini- and maxi-computers. The 360 controls the mini just as it would a 2803 tape drive, allowing the use of standard OS and DOS software without modification, according to Custom Computer Systems.

Data is transferred in the interface unit in the Forced Burst Mode on Selector or some Multiplexer channels, and in the Data Interleave mode on the remaining Multiplexer channels.

The NPR mode (direct memory access),

which the company said does not interface with the user program, is used to transfer data in the PDP-11. Transfer rates depend on the 360 model being used, but are estimated at 175 kHz, according to the company.

The interface packs and unpacks data to permit two bytes to be stored in each

PDP-11 word. Data block length, core storage area and status register contents are under PDP-11 control. The interface provides for user selection of device address in the 360.

The interface is priced at \$9,500 and is available on a 60-day delivery from 40 South Mall, 11803.

## Three Independents Bring Out 360 Main Memory Replacements

BOSTON — Main memory replacements for the IBM 360/30, 40 and 50, some of which can expand the computer beyond IBM memory specifications, have been introduced by Standard Memories, Inc., Cambridge Memories, Inc. and Fabri-Tek,

Inc. at prices 20% to 40% lower than IBM.

The memories are particularly intended for users who own their own computers and for the third party lessors. Both of these groups will benefit by having available lower-priced memory capacity that could postpone the acquisition of a more powerful computer.

The memories share the characteristic of being plug-to-plug compatible with the 360 CPU. No degradation of computer performance is claimed and software changes are not required.

The Cambridge Memories units are available in sizes to match the normal capacities of the IBM 360/30, 40 and 50. They are available in modules from 8K to 524K bytes. Deliveries began in April from 285 Newtonville Ave., Newton, Mass. 02160.

The Fabri-Tek 30+ Extension Memory can enlarge the 360/30's core capacity beyond the 64K normally offered by IBM to 128K bytes. First shipments will be made in September from 5901 S. County Road, Minneapolis, Minn.

The first Standard Memories models available will replace storage on IBM 360/30, 40 and 50 models with deliveries beginning during fourth quarter 1971.

The company said it will also make available memory sizes in excess of those available with the computer. For ex-

ample, a 360/30 memory with a capacity of 96K bytes will be offered.

Standard Memories is at 2401 South Broadway, Santa Ana, Calif. 92707.

## Narrow Ramco Hand Truck Handles 30 Reels of Tape

MEDINA, Ohio — A two-wheeled hand truck called "Lit'l Rounder" from Ramco Standard Corp. can handle up to 30 magnetic tape reels.

The device is priced at \$39.95 and is available from stock from 600 W. Liberty St., 44256.

## Doubles Univac's Memory Capacity

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## New Controller Added

# Terminals Unveiled by Memorex

By Frank Pista  
CW Staff Writer

SANTA CLARA, Calif. — Memorex has expanded its communications equipment into a full line by adding terminals, a control unit and modems.

The terminals, based on the earlier 1240 teletypewriter, include both multipoint and receive-only versions. The 1271 Terminal Control Unit (TCU) is said to offer features similar to the IBM 2701 TCU.

The 1271 TCU includes support for CRT displays and broad-band synchronous data transmission at speeds to 50,000 bit/sec. An Autocall feature for computer-generated dialing is available on the TCU.

The 1241 terminal offers 60 char/sec multipoint service, per-

mitting more than one terminal to be attached to a leased line. The 1242 offers multipoint capability along with a line buffer. The buffer permits an operator to enter data through the terminal while transmitting at 1,200 bit/sec. Buffer capacity is 256 bytes. A 512-byte version, that can be divided into two 256-byte segments, is also available.

### Keyboardless Versions

Keyboardless versions of the 1240, intended for receive-only applications, were announced. The 1250 is the simplest version; the 1251 can be used in multipoint applications; and the 1252 combines multipoint with buffering. These models, Memorex

noted, can also be used as low-cost line-printer replacements.

Capabilities added to the present 1270 TCU include a BCD to Ascii code conversion feature and a transmission capacity of 9,600 bit/sec for synchronous transmission.

The basic monthly prices of the terminals are: 1241, \$160; 1242, \$195; 1250, \$115; 1251, \$130; and 1252, \$170. Memorex said the price of the 1240 has been increased to \$145/mo. Lease price of the 1271 TCU is \$250/mo. All prices include maintenance.

Official delivery was estimated by a spokesman for first quarter 1972 from San Tomas at Central Expressway, 95052.

## Uni-Tote Controls Credit

TOWSON, Md. — An electronic point-of-sale terminal that can be connected to a central computer system via telephone lines, the Series 300 by the Uni-Tote Division of General Instrument Corp. can provide credit and inventory control in real-time.

Intended for retail store applications, the Series 300 features action guide lights showing the sequence of data entry, automatic credit checking, and the ability to operate in a stand-alone mode. It has been designed to interface with all current merchandise tag reading systems, the company said. It can accommodate wand readers as well as bar code and other reading systems, according to Uni-Tote.

Data is transmitted 21 characters at a time. A Nixie flat plane is used for displaying up to 14 digits of information.

A drum printer is built into the terminal to produce a two-part journal, one part becoming the permanent journal tape and the second used for the customer's receipt. The printer can also be used for saleschecks. Printing of 19 characters is provided.

The price of the basic register is \$2,800. Cost of the reader interface and storage is estimated to be from \$600 to \$1,000 per register. First shipments are scheduled for first quarter of 1972 from 383 Hillen Road, 21204.

## Bits & Pieces

### System 10 Converts Paper to Mag Tape

BLADESBURG, Md. — The System 10 Paper Tape to Magnetic Tape Converter from Digi-Data Corp. can provide either exact copy or a code conversion of 5- to 8-level paper tape to 7- or 9-track magnetic tape. Parity is checked on both input and output.

The unit can accommodate 500 ft rolls of paper tape and 1,200 ft reels of magnetic tape. The basic model sells for \$8,500 and can be leased for \$315/mo. Delivery is 60- to 90-days from 4315 Baltimore Ave., 20710.

### Cassettes, Printer Added To Sycor 340 Terminal

ANN ARBOR, Mich. — Sycor, Inc. has added new cassette recording and optional printing equipment for its Model 340 Communications Terminals.

The tape cassette recorder is available in single or dual configurations and reads or writes data at 1,000 char/sec. Rewind speed has been increased to 120 in/sec over prior models. It is included in the terminal.

The Model 3482 is a 50 line/min printer designed for use on remotely located Model 340 terminals. The printer handles multipart forms up to 132 columns wide. The 3482 is priced at \$250/mo on a one-year lease and delivery is within 90 days from 100 Phoenix Drive, 48104.

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like a program print-out.

## WU Plans Faster Datacom

WASHINGTON, D.C. — The Western Union Datacom bulk-transmission service, which has provided the shared use of multiplexers and channels at 150 bit/sec since it was initiated last fall, will be expanded to provide faster data rates, according to a proposed tariff filed recently with the Federal Communications Commission.

At the same time, a WU proposal that Telex charges be increased was temporarily delayed by the FCC. The carrier filed the Telex revisions along with proposed increases in its Public Message Service.

Under the proposed Datacom service, users would be able to access channels at 100, 600 and 1,200 bit/sec, in addition to the lower speed lines previously available.

The expanded Datacom tariff will take effect on June 9 if the FCC takes no action. At present, a petition to suspend the WU proposal has been submitted to the commission by MCI. Others are reported to be considering similar objections.

Under the Datacom plan, users will be able to have any mix of up to four speeds and transmission codes. An arrangement of two 1,200 and two 75 bit/sec channels running in half-duplex mode from New York to Chicago would cost \$2,542/mo, a WU spokesman said. Dedicated lines for comparable capabilities would cost about \$15,000/mo, he added.

## PBX Panel Results Will Affect Data Users

By Don Leavitt  
CW Staff Writer

WASHINGTON, D.C. — The Federal Communications Commission has established an advisory committee to study the interconnection of user-provided Private Branch Exchange (PBX) equipment with the carriers' facilities.

The standards and enforcement procedures to be developed by the Committee will probably be applied to other areas of interconnection including data equipment, according to an FCC spokesman.

The committee does not expect to "replay old ground," he said. It will study, for example, the National Academy of Science (NAS) technical report on interconnection, prepared last summer, and the Dittberner Associates' evaluation of the

NAS report.

The FCC is interested in any and all enforcement procedures the committee may recommend once standards for interconnection are established, the spokesman said.

### Communications

Certification of equipment, the procedure suggested by the Dittberner report to the FCC, may be the means of enforcement suggested but the committee is free to make whatever recommendation it wants, the FCC source added.

The advisory committee includes representatives of the established carriers, state regulatory agencies, equipment man-

facturers and suppliers. Among the computer users represented on the committee are Max Beere for the time-sharing section of Adapsco, and Charles Pedler of Teleresources Inc.

Headed by FCC Commissioner Thomas Houser, the committee has agreed on the use of Bell System terminology so that all reports and discussions have a common set of definitions.

## Data Briefs

### Line Selector Allows Modem Switching

CHERRY HILL, N.J. — A series of line selector units from Spectron Corp. allows push-button switching and interconnection of modems and communications ports. Each unit switches 16 leads of a standard RS232 interface, Spectron said.

Three models are available. While the LSU-230 is primarily used for monitoring, the LSU-1000 and -2000 provide various switching patterns. Prices range from \$880 to \$1,760 for standard units, from 1060 Kings Highway North, 08034.

### Rate Choices Provided By CTC Intertran 911

LOS ANGELES — Designed for applications involving varying data rate requirements or data rate testing, the Model 911 Intertran from Computer Transmission Corp. (CTC) can be user-adapted to provide four transmission options: synchronous rates of 2,400, 4,800 or 9,600 bit/sec; or any asynchronous rate up to 1,800 bit/sec.

The 911 costs \$1,850 from 1508 Cotner Ave., 90025.

### Badger Adds DTS 2020

RICHMOND, Calif. — Intended for short distance or in-house applications, the DTS 2020 data set from Badger Meter Inc. transmits and receives binary synchronous data at rates from 2,400 to 19,200 bit/sec, at ranges up to three miles.

DTS 2020 operation may be four-wire in full- or half-duplex modes, or two-wire in half-duplex mode. The DTS 2020 costs under \$900 from 150 E. Standard Ave., 94804.

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## Asmus Resigns Afips Post

MONTVALE, N.J. — H.G. "Charlie" Asmus has resigned from his post as executive secretary of the American Federation of Information Processing Societies (Afips), a position he established and has held since 1964.

Asmus gave a one-week notice to the Afips board of directors, which accepted it "with a great deal of regret," a spokesman for Afips said.

The resignation is the result of a "growing disagreement" with the Afips board on the "ways and means of accomplishing the goals of the federation," Asmus related.

A full-time veteran at Afips, Asmus served in a paid position for seven years, longer than any other person.

His position was junior only to that of Bruce Gilchrist, executive director since that post was created three years ago. The elected officers serve part-time, and generally do not have headquarters offices.

## 'Guidance' Members Like IBM Tie

NEW YORK — An independently formed small-computer users' group has entered the fold of IBM-sanctioned associations, according to officials of Guidance.

Only criterion for membership is to be a manager or programmer in an installation whose computer has 32K bytes of core or less. This enables users of System/3 or 360/20 to join and, according to Guidance, non-IBM computers (such as Univac 9200) also qualify a user for membership.

An IBM source said he "understood" the group had been formed of all small users, but is now entirely IBM.

## Societies

Guidance bylaws only specify, however, that individuals must be "actively engaged in managing and/or programming a small-scale computer."

The group was formed in 1967, became incorporated in 1968, and became "recognized" by IBM early this year. While the company admits to no formal recognition or affiliation process, an official did state IBM would "probably" inform salesmen of the existence of the user group, so customers could also be informed.

Chief advantage of the IBM "affiliation" is education, according to Richard Biegen, chairman of Guidance's international board. He said seminars are conducted on IBM premises, so long as they don't conflict with IBM-taught courses for which a fee is charged.

"We've also filled some voids," said Vice-President Alan Briskin, notably some internal RPG and Sys/Gen (for 360/20) seminars. A poll of the 150 members showed 99% "prefer IBM affiliation," Briskin added.

The "international" group has chapters in New York City and Long Island, and recently held meetings to form chapters in Philadelphia, plus another in West Chester (N.Y.) county.

Information from Guidance International, P.O. Box 537, Lake Ronkonkoma, N.Y., 11779.

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## KU Accepts GE/600 Users' Software

LAWRENCE, Kan. — The GE/600 Users' Association has presented design concepts for a records management system to Kansas University, site of the group's recent annual conclave.

During the meeting, which drew about 250 users, KU's Vice-Chancellor for Academic Affairs, Francis Heller, said both computers and higher education had been oversold, DP to management, and education to the public.

A better-educated public has realized many problems do not have easy solutions, Heller noted, adding it is a false notion that computers "will solve everything."

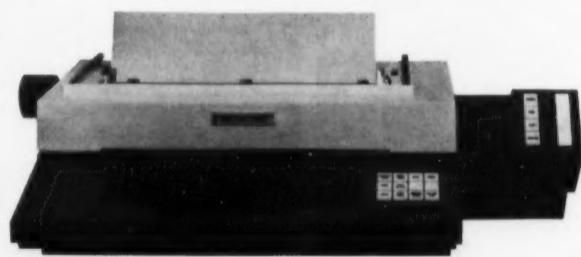
Believing the economic pinch is here for a while longer, Heller called on users, salesmen and technicians to "re-establish their

credibility" in order to justify large investments.

The group also voted to change its name to Honeywell Large Systems Users' Association.

When fully implemented, the records management system will involve computer terminals located throughout campus, making accessible information on students and faculty members, educational and financial activities, plus data on university employees.

Classification of users and establishment of security clearances and access procedures are currently being studied at the university, now that the user group has provided the software concepts. The five-year project was begun last year, and experimental use will probably be initiated next Fall.



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# **COMPUTER PROTECTION/INSURANCE WORKSHOP**

**Monday, June 14, 1971, PICK CONGRESS HOTEL—CHICAGO**

*Produced jointly by the publisher of BUSINESS INSURANCE news-magazine and the publisher of COMPUTERWORLD newsweekly*

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## **Melvin Bockelman**

Data processing manager, Kansas City Police Department, on computer operations and invasions of privacy.

## **Warren G. Brockmeier**

Director-western region risk management department, Ebasco Services Inc., on risk management for computer centers.

## **Robert J. Dolan**

Vice president, Rollins Burdick Hunter Co., on computer liability insurance.

## **Karl W. Fruecht**

Corporate vice president, Household Finance Corp., on physical protection for computer installations.

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## **Rolf H. Jensen**

Chairman and professor, fire protection engineering department, Illinois Institute of Technology, on computer fire protection.

## **Gordon M. Paine**

Assistant secretary, St. Paul Fire and Marine Insurance Co., on property insurance for computer facilities.

## **Louis Scoma, Jr.**

President, Data Processing Security, Inc., on security for computer facilities.

## **Michael Verbick**

Manager data processing, Playboy Clubs International, on security and protection for computer records.

## **Herbert T. Walworth**

Manager, special technical services section, Kemper Insurance Cos., on protecting computer room employees.

## **Dr. Robert Wiper**

Behavioral psychologist on the care and feeding of computer room employees.

## **Fred Zeleny**

Chief engineer, western regional office, Factory Insurance Assn., on fire protection for computers.

## **R. C. Bjorklund, T. J. Morton**

Moderators. R.C. Bjorklund, editor, *Business Insurance*, and T.J. Morton, Midwest bureau chief, Computerworld.

with an early registration fee of only \$90. By registering now before June 1, you save \$15. Additional registrations from your company, when submitted together, cost only \$75 each.

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### **NOTE:**

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Check here if you want the Pick Congress Hotel to send you room information.

# COMPUTER INDUSTRY

a Computerworld news section about the nation's fastest growing industry

June 9, 1971

Page 23

## CI Notes

### Data General, Japan Agree

SOUTHBORO, Mass. — Data General has gotten the OK from Japan to market its minicomputers there. The Ministry of International Trade and Industry has approved an exclusive royalty-bearing three-year licensing agreement between DG and the Nippon Minicomputer Corp., a consortium of seven Japanese firms, none of them major computer manufacturers.

Marketing should begin immediately. DG expects a substantial volume of both components and minis to be sold in Japan as a result of the agreement.

### New ADL Unit Busy

CAMBRIDGE, Mass. — Arthur D. Little's new software subsidiary, ADL Systems Inc., already has \$600,000 of programming contracts turned over by project groups in the parent. Plans call for a volume of \$1 million in the first year. According to ADL the software market — now pegged at \$800 million — will grow to \$1.7 billion by 1975. ADL Systems will operate out of Cambridge.

### DoD Evaluation Chief Named

WASHINGTON, D.C. — There's a new man in charge of test and evaluation for research and engineering projects at the Department of Defense, Lt. Gen. Alfred D. Starbird, USA (Ret.). Starbird is now deputy director (test and evaluation), Office of the Director of Defense Research and Engineering. The general's post is a new one, created on the recommendation of a blue ribbon panel which made 113 recommendations for streamlining the department last summer.

### Datatype Hitched With Photon

MIAMI — OCR-making Datatype has signed Photon as exclusive marketer for three years. The phototypesetting company will have exclusive marketing rights to the Dataflow OCR system, and will accept about \$250,000 of equipment the first year. Datatype has been peddling the low-cost Dataflow since late 1970.

### More Layoffs Hit ICL

LONDON — While Sir John Wall was speaking at the Spring Joint, another 800 people at ICL's Croydon plant were being readied for layoff. This follows a reduction of 250 in March. The Croydon operation, called a small one, produces parts for older 1900 series computers.

### Supershorts

The French Government's communications monopoly has leased "several" Honeywell Bull computers from Diebold Computer Leasing. But it's cheaper that way, . . .

The College of American Pathologists has commissioned a study of dedicated laboratory computer systems to provide data on how to achieve better and cheaper patient care. The study will be done by Northbrook, Ill.'s, J. Lloyd Johnson Association.

Data Products has signed to produce print hammer components for NCR's high-speed printers. Over a three-year period the contract could reach \$8 million, largest in Data Products' history.

### Aggressive Stance Has Little Risk

## IBM Reassertion May Mean Power Shift

By Michael Merritt

CW Staff Writer

For over 15 years IBM walked in fear of the Sherman and Clayton Acts, measuring each marketing move against the possibility of suffering the fate of the Standard Oil Trust.

And a marvelous job of dancing on eggshells it did. Confronted with the need to expand earnings constantly and maintain the market price of its stock without expanding its total percentage of customer base, IBM performed feats of managerial brilliance for 15 years, without equal in the history of business.

Until the history of IBM in the 60s is written 25 years from now, no one will know the full story of the juggling act at Armonk. But the planning and calculation that went into it might be symbolized by the politics of the Watson brothers. Thomas is the cautiously liberal Democrat, a Kennedy man and party contributor. Arthur is the cautiously conservative Republican, a Nixon man and party contributor.

At IBM you cover the contingencies.

But somebody's been kicking over the traces on the top floor at Armonk. Since the 1968 bulge of purchase by the leasing companies and the growth in 1970 of independent peripherals manufacturers, IBM has not been able to control its destiny with the precision it demands.

Things have been going astray. The plan, the rational dominance of a chaotic universe, has failed.

And now the mask of self-possession has begun to slip. Where once IBM would have shown itself monumenally indifferent to the minor vagaries of the marketplace, now the underlying motivation to win, to make money, to control — to be IBM — is reasserting itself.

### Price War

No more careful consideration for the independents. No more careful tuning of lease-purchase ratios and maintenance costs. IBM's in a price war. No more fear of the Justice Department. IBM is going to take what is its own.

The 8% to 16% peripheral price cut last week will certainly work out to the advantage of users. Various industry analysts have calculated that the decrease will reduce overall system hardware costs from 3.5% to 8%, and the consensus is 5%.

This is a greater hardware price cut than IBM gave when it unbundled, and the fattest goodie IBM has given its customers in the history of data processing.

Last December IBM made a similar move, introducing "new" tape and disk drives that effectively reduced the cost of the units 15% to 19%. The cut was obviously designed to make IBM units more competitive with the products of the independent peripheral makers.

It is not clear that it achieved the objective of retaining IBM's customer base, though. The returns are mixed, but at least three of the disk makers reported that order rates actually increased after IBM's December move. The independents cut prices, and the prestige of forcing IBM into competitive practices actually bolstered their selling position.

### Other Cuts

Since then there have been other smallish IBM price cuts — on the 2361 bulk core storage, off 40%; early models of the 360/20, off 30%; and the 360/44, off 25%. There was also a refitted

360/30, issued under the title 360/22 at a reduced price, and there are strong rumors that there will shortly be a refitted 360/40.

### May's Slash Most Drastic

But the slash of May was by far the most drastic. Analysts at the International Data Corp. have estimated that it will reduce IBM's data processing revenues by almost 3%, not considering increased revenues from sales and new or retained business.

From a rental base of an estimated \$2.6

### Analysis

billion a year at the end of 1970, this cut — without considering compensation from new business — would risk a revenue drop of \$74 million a year, or a little more than \$6 million a month.

IDC also estimates that the independents are currently taking business from IBM amounting to about \$8 million a month, and that the independents' share would have peaked at \$12.6 million a month this year.

### Risk Less Than Reward

So IBM's move is a well-calculated one; the risk is much less than the reward. And of course, IBM revenues will not drop by \$6 million a month because of the cut. There will be customers attracted by the 15% purchase discount who will immediately bolster revenues by purchasing equipment and customers considering independents who will return to the fold. Interestingly, though, IBM is not encouraging purchase. The discount for signing a two-year lease is one point more than the discount for purchase. This has the effect of slightly increasing the lease-purchase ratio. For three typical peripherals, the 2314, the 2401 and the 1403, the ratio after both discounts moves up by about one month, from 45 to 46 months.

And if customers see themselves using their present IBM equipment for the next three years, they will still be paying significantly less money than if they purchased their equipment.

There's little motivation to purchase in the new price structure.

### More Competitive

IBM's price reduction has made IBM much more competitive with the independents, both in terms of price and in terms

of satisfying customer desire for a break on long-term leases.

The cuts may also enable IBM to regain control over its customer base, and get just the amount of use it desires from its equipment inventory.

### IBM Pays a Price

But IBM has had to pay a price for this new competitive stance. It has had to desert its comfortable role of omnipotent industry father, capable of making a profit no matter what the weather. It has had to unlimber some of the guns that had been mothballed out of wariness of the Justice Department. And it has had to risk driving some of its weaker competitors out of business — while it only wants to control its lion's share of the market, not take the whole apple.

The most serious threat is the Justice Department. Independents and their trade organization have already had conferences in Washington, trying to move Justice to take action.

In the short term, IBM is safe. Any action would take five to 10 years to complete, well beyond the peak of the product life of the peripherals in question.

In the long term, though, especially if Justice can show that IBM drove some of its weaker competitors to the wall, IBM is running the risk of being broken up.

For a decade IBM has been the target, and competitors have grown sleek finding and exploiting chinks in the giant's defenses. The reawakening of the giant shows it has decided to win some of the challenges, to confine the losses to 15% of its customer base.

It may also indicate a power shift on the top floor at Armonk. Though no one outside knows the fighting that went on prior to the price cut, it is known that Tom Watson suffered a heart attack late last year, and was recuperating for the first quarter of 1971. At the annual meeting in April, he shared the duties with IBM President T.V. Learson. Arthur Watson is ambassador to France, and, for the while, uninvolvement in the management of IBM.

At the annual meeting Tom Watson told shareholders that he had no plans to retire, and that he was going to remain chairman. A shift of power from his hands might be entirely fictitious, and T.J. himself might have inspired the price cuts.

But the change of policy is radical and dramatic, and at the very least, the next few years are going to be interesting to watch.

## Software Due for Improvements?

Programmatics is a veteran in the field of developing compilers and has previously dealt primarily with manufacturers at a fixed price.

### 'Direct to End User'

It is now beginning to market a product for the System/3, Pi Fort. "With unbundling we can go direct to the end user," Ferguson said. He acknowledges his main problem is reaching the System/3 users since they are almost all new users. The firm plans to lean heavily on direct mail for marketing and is offering full support to the independent users' organization, Nasu.

# RCA Plans to Build Full-Cycle, 1 Mbit Laser Memory

PRINCETON, N.J. — A computer memory which will allow a million bits of data to be written, stored, read out repeatedly, or erased by laser light will be built by RCA for the National Aeronautics and Space Administration.

When completed next spring, the experimental, six-feet long, telescope-shaped device will be the first full-cycle, all-optical memory ever built, according to Dr. William M. Webster, vice-president, RCA Laboratories, here.

"It could set the stage for the development of a whole new species of mass memories that are equal in storage to but 1,000 times faster than the biggest disk system achieved so far," he noted.

Dr. Jan A. Rajchman, staff vice-president of RCA Informa-

tion Sciences, who is directing development of the optical memory, and Robert D. Lohman, Project Supervisor, outlined the structure and operation of the unit.

A laser beam, generated by a pulsed ruby laser, first passes through two acousto-electric crystals that are electronically controlled. The crystals deflect the beam in direct proportion to the frequency of sound waves made to pass through them. One crystal bends the laser beam from left to right, the other, up or down.

As a result, there are 1K different positions in space at which the beam can be aimed as it emerges from the second crystal.

The deflected beam then strikes one of 1K different holo-

grams, optical interference patterns, in a flat array called a "hololens." The hololens splits the beam into two parts, one of which goes straight through while the other is diffracted to fall on a flat plane 3 in. square composed of 1K liquid crystal cells — tiny areas that can be made reflective or transparent electronically.

These cells introduce digital information into the laser beam in the form of tiny areas that are dark — where the liquid crystal cell is reflective — or light — where it is transparent. These correspond to the binary code and constitute the data to be written into the memory.

This coded, or modulated, laser beam is now directed to one of the 1K positions available on a manganese-bismuth film where it

recombines with the first, or straight-through, part of the beam, causing formation, at the position selected, of a magnetic hologram — a magnetic equivalent in the film of the optical interference pattern produced on it by the two converging laser beams.

The information represented by the liquid crystal pattern is holographically stored.

Read-out is achieved by sending another laser beam through the system so that it strikes the hologram selected for read-out on the manganese-bismuth film, but not the liquid crystal array.

The beam reconstructs the image of light and dark areas stored in the hologram and projects it onto an array of light-sensitive elements that produce the electronic equivalent of the data. In

the NASA prototype, the array will be connected to a panel of lights for test purposes.

Erasure is accomplished in the same manner as writing, except that neither beam is modulated or coded by the liquid crystal array. As a result, the selected position struck by the two light beams is rendered magnetically neutral.

No damage is done to the film, however, and the write, read and erase operations can be repeated as often as desired.

The system is expected to validate the optical memory concept and establish a base for the possible development of units that could be installed in space stations, earth resources satellites, and similar spacecraft that need to store and process extremely large volumes of data.

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## Orders and Installations

The Citizens National Bank & Trust Co., Towanda, Pa., has installed an IBM System 3/10 to process savings accounts, installment loans, Christmas Club and Ready-Credit.

NCR Century 200s have been ordered by the Algemene Bank Nederland N.V. in London, and the S.A. Permanent Building Society in Johannesburg, S. Africa. A Century 100 is being installed by the Companhia de Seguros Fidelidade in Portugal.

General Services Administration has installed TDS-711 and TDS-733 disk drives, and TDS-833 controllers, valued at \$2.1 million, from Tracor Data Systems, Inc., Austin, Texas.

Symbolic Control, Inc., San Mateo, Calif., is installing its

Apt/70 at the Rohr Corp.

A Honeywell Model 1015 has been ordered by the Framingham (Mass.) Trust Co.

The Electronic Engineering Co. of California, Santa Ana, will install Eco hotel computer systems at the Dorado Beach Hotel and Cerromar Beach Hotel, both in Puerto Rico.

Six GE-Pac 4010 process computers have been ordered by the Duke Power Co.

The Sherwin Williams Co. has installed a Digitronics Dial-O-Verter system.

An IBM 360/50 has been installed at the Provident Life and Accident Insurance Co., Chattanooga, Tenn.

Target Stores of Minneapolis has ordered two computerized cash register systems, valued at \$200,000, from The Singer Co.'s Friden Division.

CRC Information Systems Ltd. has ordered a Xerox Sigma 9 for its service bureau in London.

**WHAT'S AHEAD** for the computer industry in the 1970's, as the recession draws to an end?

**HOW WILL** the mainframe builders fare? The independent peripheral makers? The crowded service and software industry?

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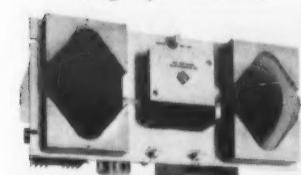
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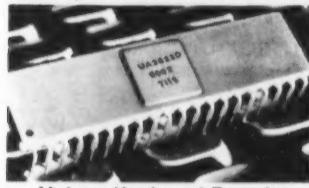
Wang Tape Formatter



Potter Print System



Superior Electric Reader



Unisem Keyboard Encoder



Data Trends Tape Cassette

## Executive Corner

■ Computer Leasing Co., Washington, D.C., has named E. Lee Meadows executive vice-president and Hayden E. Williams vice-president, field sales.

■ Andrew Smith II has been elected to vice-president, operations of The Computer Co., Richmond, Va.

■ Marshall J. Styll has been appointed vice-president, operations of Datanetics Corp., Redondo Beach, Calif.

■ Dirk Keijer has been named president of Itel International of San Francisco.

■ Lawrence H. Berul has been named senior vice-president and general manager of Aspen Systems Corp., Pittsburgh, Pa.

■ MRI Systems Corp., Austin, Texas, has elected Jack A. Strong a vice-president.

■ Eldon E. Anderson has joined Morgan Information Systems, Inc., Palo Alto, Calif., as vice-president of manufacturing.

■ Mitchell Rosenbaum has been elected vice-president and secretary of Inter-Computer Electronics, Inc., Lansdale, Pa.

### Superior Tape Unit Reads up to 500 char/sec

BRISTOL, Conn. — The Slo-Syn photoelectric tape reader type TRP500 from Superior Electric has a reading rate of 0 to 500 char/sec and is TTL, DTL or RTL compatible. Both normal and inverted outputs are available. Priced at \$980, it is used with 1-in. wide, 8-channel tape having a maximum light transmission of 40%. Tape handling is either loop type or fanfold with trays for up to 200 feet of tape.

### Wang Mag Tape Formatter Provides PE, NRZI Logic

LOS ANGELES — Wang Computer Products' Magnetic Tape Formatter provides the logic necessary for reading and writing IBM-compatible 1,600 char/in.

phase-encoded (PE), NRZI magnetic tape, or both.

The unit can contain either two NRZI formatters and a computer adapter board, or one NRZI formatter and one PE

in./sec operating speed. Maximum storage capacity exceeds 500,000 characters. The firm is at 2 Penn Plaza, 10001.

### MOS Keyboard Encoder Works in 4 Modes

TREVOSE, Pa. — A keyboard encoder from Unisem translates signals from up to 128 keys into any of four different modes. Each mode is completely independent, providing a total of 512 different 9-bit word possibilities from the encoder.

Designated UA3533, the universal encoder is a specialized MOS read-only memory. The ROM may be programmed for BCD, Usascii, Ebcdic, or any other code with 9 bit/word or less. Physically, the ROM is arranged as four groups of 128 by 9-bit code locations. Shift and control inputs select one of the four groups, providing code generation in four modes: no shift, no control; shift, no control; no shift, control; and shift and control.

Unisem Corp. is at P.O. Box 11569, Philadelphia, 19116.

### Dialight Decoder Debuts

BROOKLYN, N.Y. — To drive Dialight's series 745 single-digit solid state numeric display, the firm is marketing a BCD to seven-segment decoder, Model 704-1554. The unit converts four lines of BCD code into the appropriate outputs, which in turn drive the single-digit solid state readout.

The units are priced at \$5.95 each and \$3.78 in quantities from 60 Stewart Ave., 11237.

## New OEM Products

formatter. Each can control up to four tape drives.

Either formatter contains logic that provides status information for the computer or special-purpose device. Each unit provides timing necessary for the generation of IBM-compatible inter-block gaps and correct head positioning between records.

The company is at 2000 Stoner Ave., 90025.

### Cassette Drive Under \$500

NEW YORK — Data Trends, Inc. has entered the digital cassette drive market with a unit featuring start-stop performance rated at less than 20 msec at 10 in./sec. Priced under \$500, the device features a transfer rate of 8,000 bit/sec.

The Trends C-100 conforms to the European Computer Manufacturers Association (Ecma) 800 bit/in. serial phase-encoding standard, and densities up to 1,000 bit/in. are optionally available. The unit is bidirectional, and the device is designed for continuous operation, and includes a forward search capability which allows any block of data to be located at 80 in./sec and then read back at normal 10

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# 360/CORE

## Nickels & Dimes

The assets of Peripheral Processor Co. of East Hanover, N.J., are for sale. The company has developed a data processor with communications capabilities that would sell for under \$2,000, and prototypes have been tested and are ready for production. PPC couldn't find its second round of financing.

**SSS**

In case you hadn't heard, the Nasdaq system is now offering a continuous price index for the over-the-counter market on the order of the Dow Jones or American index. The index is calculated every five minutes and disseminated over the 35,000 terminals hooked up to Nasdaq.

**SSS**

Singer & Mackie, New York stock trading house, has installed a minicomputer-based trading system that does away with the old practice of shouting across a crowded room to effect a transaction. On-line video terminals to the mini can be used both for price queries and for making actual purchases. The system was designed by Futuristic Applications, Inc. of Wayne, N.J.

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## MAI's Exchange Offer Complete, Insolvency Ends

NEW YORK — Management Assistance, Inc., the ailing lessor of tabulating and DP equipment, is not insolvent anymore.

Over 70% of the principal of MAI's debentures has been tendered for exchange with a package of preferred and common stock. This converts about \$44 million of MAI's indebtedness to equity and eliminates a negative shareholders' equity of about \$28 million.

As a result of the successful consummation of the plan, MAI's shareholders' equity will be about \$15 million as of March 31, 1971.

Raymond P. Kurshan, executive vice-president, finance and administration, and MAI's interim chief operating officer, announced that, as a result of the effectiveness of the exchange offer, the rescheduling of maturities on MAI's secured indebtedness and senior subordinated notes, and the other changes provided for in amended agreements with senior institutional creditors would now become effective.

In addition, MAI noted that its results of operations for the six months ended March 31, 1971

would be restated to reflect net income of \$1.8 million, after extraordinary credits arising from the interest being waived under the plan, rather than the net loss of \$833,269 previously reported.

## REI First Half Turns Upward

DALLAS — Recognition Equipment has reported net income of \$1.01 million or 20 cents per share for the first six months of fiscal 1971, ended April 30. This compares with a net loss of \$5.9 million or a \$1.17 per share loss on a restated basis for the first half of fiscal 1970. Operating revenues were \$18.6 million, up from the \$17.6 million reported for the comparable year-earlier period.

Shipments were \$6.9 million during the first half of the year. During the second six months, shipments are expected to be substantially larger than the first six months, but for the year will be less than the fiscal 1970 level.

The backlog of signed contracts and letters of intent on April 30 was \$26.5 million.



## financial

## Investors Earnings a Record

STAMFORD, Conn. — Computer Investors Group has reported record revenues and earnings for the year ended March 31.

Income after taxes before extraordinary items rose 46% to \$1.3 million from \$907,607 for the previous year, and earnings per share before extraordinary items increased 38% to 65 cents per share, as compared with 47 cents in fiscal 1970. Gross revenues increased 20% to \$10.1 million compared to \$8.4 million in the prior year.

Computer Investors Group also reported an extraordinary gain of \$175,725 or 8 cents per share resulting from the purchase of a portion of its 5-3/4% subordinated convertible debentures at less than the principal amount and an extraordinary loss of \$120,000 or 5 cents per share, arising from a provision for the estimated loss on its investment and advances to its semiconductor affiliate.

## Keane Shows Poor First Quarter

WELLESLEY HILLS, Mass. — Keane Associates, Inc. revenue for the first quarter of 1971 amounted to \$642,293 as compared to \$660,465 for the 1970 period, the company reported. Net income after taxes

amounted to \$21,305 as compared to \$81,487. Earnings for the quarter were equal to 3 cents per share based on 845,100 shares in 1971, compared to 11 cents per share on 712,654 shares in 1970.

## New Registrations

**COMPUTER SYSTEMS DESIGN '72 WEST**

FEB 22, 23, 24, 1972

Anaheim Convention Center  
Anaheim, California

**COMPUTER SYSTEMS DESIGN '72 EAST**

APRIL 18, 19, 20, 1972

John B. Hynes Civic Auditorium  
Boston, Massachusetts

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peripheral and data handling equipment and in providing DP services and arranging transportation leases, has filed to register \$30 million of convertible subordinated debentures, due 1996. Proceeds intended for prepayment of borrowings and for working capital and other corporate purposes. The underwriters are Dean Witter & Co., 45 Montgomery St., and duPont Glore Forgan, Inc., Bank of America Center, both of San Francisco.

COMPUTER IMAGE CORP., 260 S. Beverly Drive, Beverly Hills, Calif., a company organized to develop and produce and market a computer system for generating animated images, has filed to register 150,000 shares of common stock. Proceeds, at \$18.50 per share maximum, intended for purchase of electronic equipment and for working capital and other corporate purposes. The underwriter is Boettcher Bros., 80 Wall St., New York 10003.

SPERRY RAND CORP., 1290 Avenue of the Americas, New York, N.Y., a company engaged in developing, manufacturing and marketing business and other equipment and other products, has filed to register \$160 million of sinking fund debentures. Proceeds intended for the reduction of short-term debt and term bank loans. The underwriter is Eastman Dillon, Union Securities Inc., One Chase Manhattan Plaza, New York 10005.

PRO DATA, INC., Atlanta, Ga., a company organized for the purpose of selling and servicing office business machines and equipment, and in related activities, filed to register 75,000 shares of common stock. Proceeds, at \$6 per share, intended for purchase of demonstration equipment and funding of initial operating expenses of new offices and for expansion of present suboffice, and for general corporate purposes. The underwriter is Leonard Brothers, Inc., 50 Broadway, New York 10004.

TEL CORP., One Embarcadero Center, San Francisco, Calif., a company engaged in the manufacture and sale or lease of computer, computer

OPTICAL MEMORY SYSTEMS, 15200 S. Lyon St., Santa Ana, Calif., a company engaged in research, development, production and marketing of optical Read-Only Memory devices, has filed to register 150,000 shares of common stock. Proceeds, at \$5 per share, intended for research and development and for working capital and other corporate purposes. No underwriter is involved.

AFCOA, 20801 Dearborn St., Chatsworth, Calif., a company engaged in the design, manufacture and sale of a wide variety of parts and assemblies for computer disk, drum and tape memory and recording systems, has filed to register 200,000 shares of common stock. Proceeds, at \$30 per share maximum, intended for securing larger facilities and purchasing additional production and test equipment for the company's Korean subsidiary, and for working capital for general corporate purposes. The underwriter is Herbert Young & Co., Inc., 5 Hanover Sq., New York 10005.

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# Computerworld Stock Trading Summary

All statistics  
compiled, computed  
and formatted by  
TRADE QUOTES, INC.  
Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, JUNE 3, 1971

EXCH	PRICE				EXCH	PRICE			
	1971 RANGE (1)	CLOSE JUN 03 1971	WEEK NET CHNGE	WEEK PCT CHNGE		1971 RANGE (1)	CLOSE JUN 03 1971	WEEK NET CHNGE	WEEK PCT CHNGE

## SOFTWARE & EDP SERVICES

O ADVANCED COMP TECH	1- 4	1 1/2	+ 1/8	+9.0
A APPLIED DATA RES.	5- 13	8 5/8	+ 1/2	+6.1
O APPLIED LOGIC	1- 3	1 1/4	- 1/8	-9.0
O ARIES	1- 2	1 1/4	0	0.0
N AUTOMATIC DATA PROC	44- 60	59 5/8	+2 7/8	+5.0
O AUTO SCIENCES	5- 8	5 5/8	- 3/4	-11.7
O BOOTHE DATA SYS	1- 2	1 3/4	0	0.0
O BRANDON APPLIED SYS	1- 1	3/4	0	0.0
O COMPUTER ENVIRON	1- 2	1 1/8	- 1/8	-10.0
O COMPUTER INDUS.	4- 5	5	0	0.0
O COMPUTER NETWORK	3- 10	6 1/2	- 1/2	-7.1
O COMPUTER PROPERTY	6- 11	7 1/4	- 1/4	-3.3
N COMPUTER SCIENCES	9- 17	15 5/8	+1 1/4	+8.6
O COMPUTER TASK GROUP	1- 3	2	- 1/4	-11.1
O COMPUTER USAGE	5- 16	7 5/8	-1 1/2	-16.4
O COMP AUTOMOT REPORTS	6- 13	10 1/4	+1 1/4	+13.8
A COMPUTING & SOFTWARE	27- 45	39 1/2	+1	+2.5
O COMRESS	2- 4	3 5/8	+ 1/8	+3.5
O COMSHARE	4- 8	5 3/4	- 1/4	-4.1
O CONSOL. ANAL. CENT.	1- 2	1 5/8	0	0.0
O DATA AUTOMATION	1- 4	2	- 1/4	-11.1
O DATA PACKAGING	7- 10	7 3/4	0	0.0
O DATAMATION SERVICE	1- 3	1	0	0.0
L DATATAB	4- 10	9	- 3/8	-4.0
O DIGITEK	1- 3	2	- 1/4	-11.1
O EDP RESOURCES	7- 16	12 1/2	+ 1/4	+2.0
A ELECT COMP PROG	3- 7	4	+ 1/8	+3.2
N ELECTRONIC DATA SYS.	59- 85	68 7/8	+3 5/8	+5.5
O INFORMATICS	7- 15	11 7/8	- 1/4	-2.0
A ITEL	15- 23	15 3/4	0	0.0
O KEANE ASSOCIATES	9- 14	6 1/2	- 1/2	-7.1
O KEYDATA CORP	10- 14	10	- 3/8	-3.6
A MANAGEMENT DATA	8- 11	9 5/8	-1 1/2	-10.4
O NATIONAL CSS INC	7- 14	12	+ 1/2	+4.3
O NAT COMP ANALYSTS	1- 4	2 1/4	- 1/4	-10.0
O NAT.COMP. SERV.	2- 3	3 1/2	0	0.0
N PLANNING RESEARCH	16- 26	21 1/2	+ 1/4	+1.1
O PROGRAMMING METHODS	18- 29	22 1/2	0	0.0
O PROGRAMMING & SYS	2- 4	2 1/2	0	0.0
L PROGRAMMING SCIENCES	1- 3	1/4	- 1/8	-33.3
O SCIENTIFIC RESOURCES	1- 2	7/8	- 1/8	-12.5
O SOFTWARE SYSTEMS	1- 2	1 1/2	+ 1/8	+9.0
O TBS COMPUTER CENTERS	5- 9	5 1/4	- 1/8	-2.3
O TOLLEY INTL CORP	3- 8	6	- 1/8	-2.0
O UNITED DATA CENTER	2- 6	4 3/8	0	0.0
N UNIVERSITY COMPUTING	21- 38	36	+2 5/8	+7.8
A URS SYSTEMS	7- 11	7 7/8	+ 3/4	+10.5
O U.S. TIME SHARING	1- 3	1 3/4	- 1/8	-6.6
O VORTEX CORP	1- 2	1	+ 3/8	+60.0

## PERIPHERALS & SUBSYSTEMS

N ADDRESSOGRAPH-MULT	24- 48	47	+ 1/2	+1.0
O ALPHANUMERIC	3- 6	3 7/8	+ 1/8	+6.8
N AMPLEX CORP	17- 25	18 1/2	+ 5/8	+3.4
O ASTRODATA	1- 2	1 5/8	0	0.0
O ATLANTIC TECHNOLOGY	3- 8	5 5/8	- 1/8	-4.2
A BOLT, BERANEK & NEW	6- 8	7	- 1/8	-1.7
N BUNKER-RAMO	10- 17	13 1/4	+ 3/8	+2.9
A CALCOMP	23- 33	25 1/8	- 2 1/4	-8.2
O COGNITRONICS	5- 9	6 1/4	- 1/8	-3.8
O COLORADO INSTRUMENTS	4- 8	4 1/8	0	0.0
O COMPUTER COMMUN.	6- 19	11	0	0.0
A COMPUTER EQUIPMENT	4- 7	6 1/8	- 1/2	-7.5
A COMPUTEST	12- 20	13 1/2	+1	+8.0
O CONSOL COMPUTER LTD.	8- 12	11	- 1/2	-4.3
A DATA PRODUCTS CORP	6- 10	8	+1	+14.2
O DATA TECHNOLOGY	3- 9	6 3/4	- 1/2	-6.8
O DIGITRONICS	4- 8	5 3/8	+ 1/8	+4.8
N ELECTRONIC M & M	8- 16	15	- 1/2	-3.2
O FABRI-TEK	2- 4	3 3/8	- 1/8	-3.5
O FARRINGTON MFG	1- 3	1 1/8	- 1/8	-10.0
O FOTO-MEM INC	1- 6	1	- 1/8	-11.1
O INFOREX INC	31- 48	35 1/2	+1	+2.8
O INFORMATION DISPLAYS	5- 8	4 7/8	- 3/8	-7.1
O MANAGEMENT ASSIST	1- 2	1	0	0.0
A MARSHALL INDUSTRIES	18- 27	18 3/8	- 3/4	-3.9
A MILGO ELECTRONICS	18- 26	17 3/4	- 3/4	-4.0
N MOHAWK DATA SCI	23- 47	41	+1 3/4	+4.4
O ON LINE SYSTEMS INC	7- 18	14 3/4	0	0.0
O OPTICAL SCANNING	13- 18	13 1/4	0	0.0
O PHOTON	7- 12	10 1/8	+1 3/8	+15.7
O PHOTO-MAGNETIC SYS.	1- 5	4	- 1/2	-11.1
A POTTER INSTRUMENT	17- 25	17 1/2	- 3/4	-4.1
O PRECISION INST.	7- 14	10	+1	+11.1
O RECOGNITION EQUIP	14- 26	19 1/4	-1	-4.9
O REDCOR CORP.	5- 9	5 7/8	- 1/2	-7.8
N SANDERS ASSOCIATES	13- 22	19	- 3/8	-1.9
O SCAN DATA	6- 11	8 7/8	+1 5/8	+22.4
O TALLY CORP.	11- 16	10 5/8	- 1/4	-2.2
N TELEX	15- 22	16 1/4	- 3/8	-2.2
O VIATRON	1- 4	7/8	0	0.0

## SUPPLIES & ACCESSORIES

N ADAMS-MILLIS CORP	14- 19	14 1/2	- 5/8	-4.1
O BALTIMORE BUS FORMS	6- 10	8 3/4	+ 1/4	+2.9
A BARRY WRIGHT	8- 13	9 3/8	- 1/8	-1.3
A DATA DOCUMENTS	18- 29	22 7/8	+ 1/8	+0.5
O DUPLEX PRODUCTS INC	8- 10	8 1/2	0	0.0
N ENNIS BUS. FORMS	10- 13	10	- 1/8	-1.2
O GRAHAM MAGNETICS	9- 33	26 1/2	+1 1/8	+4.9
O GRAPHIC CONTROLS	6- 15	15 1/8	+1 5/8	+12.0
N MEMOREX	47- 78	48	-3	-5.8

## Earnings Reports

### SYNTONIC TECHNOLOGY

Nine Months Ended March 31

	1971	1970
Shr Ernd	\$ .34	\$ .41
Revenue	4,602,410	3,357,607
Earnings	160,165	183,310

### BUNKER-RAMO CORP.

Three Months Ended March 31

	1971	1970
Shr Ernd	\$ .11	\$ .12
Revenue	\$ 52,500,713	61,532,562
Earnings	323,110	2,873,277

a-Common share earnings weren't calculated as preferred dividend requirements exceeded net income.

### TRACOR INC.

Three Months Ended March 31

	1971	1970
Shr Ernd	\$ .11	\$ .16
Revenue	\$ 20,056,000	19,512,000
Spec Cred	526,000	531,000

a-Based on income before special credit. b-From sale of investments. c-Equal to 17 cents a share.

### ELECTRONIC MEMORIES & MAG.

Three Months Ended March 27

	1971	1970
bShr Ernd	\$ .04	\$ .10
Revenue	22,175,000	21,991,000
Tax Cred	574,000	574,000

Earnings \$1,057,000 784,000

a-Restated by company. b-Based on income before tax credit. c-Equal to 15 cents a share.

### DATA DESIGN LABORATORIES

Nine Months Ended March 31

	1971	1970
Shr Ernd	\$ .01	\$ .22
Revenue	6,284,381	5,516,370
Earnings	7,954	230,198

### CALIF. COMPUTER PRODUCTS

Nine Months

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